# The IRON AGE

The National Metalworking Weekly

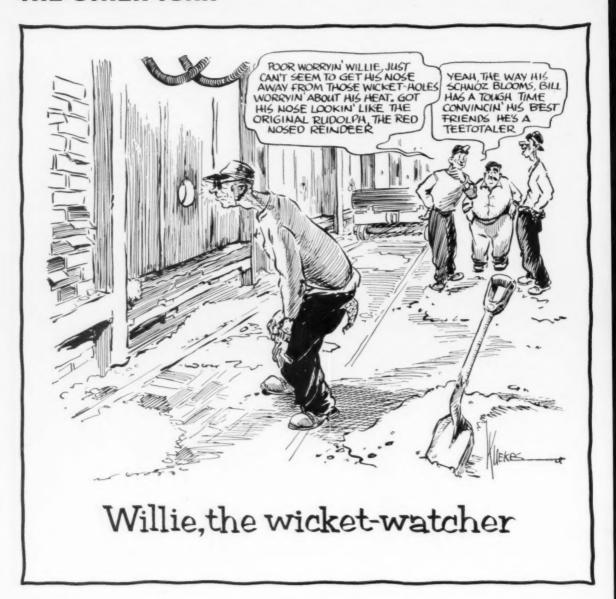


Is U. S. Steel's Labor Policy Realistic? P.51

How To Buy Screw Machine Products P.56
New Glass Molds Make Smoother Castings P.91

Digest of the Week P-2

#### THE OTHER TURN



The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.





### **Cuts Costs with Special Sections**

Here's a technique that could help you cut production costs if you make a product in large quantities. One producer who has used it with outstanding success is Rockford Acromatic Products Company, of Rockford, Ill., specialist in automatic-machine products.

This company is busy turning out universal joint parts from Bethleem special-section bar stock. Fornerly made from individual blanks, tiey are now produced at far less sost. Feeding long lengths of carbonsteel bar special sections into their high-capacity automatic machines, Rockford Acromatic produces finishmachined bearings at the rate of 1 every 18 seconds per machine.

Bethlehem special sections are supplied in bar lengths that are especially suitable for automatic machining. But however your product is made, it may well pay you to investigate the use of special sections. By designing with a special section in mind, you can provide weight and strength where it is

needed, while eliminating excess metal. You can get a high-quality product with reduced machining and scrap loss. This may mean big savings in your operations.

Let us give you more information about hot-rolled special sections, and how they could help you cut production costs. Please call the Bethlehem sales office nearest you.

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BETHLEHEM STEEL



METALWORKING

May 10, 1956-Vol. 177, No. 19

## , IRON AGE

### Digest of the Week in Metalworking

Starred items are digested at right.

EDITORIAL	
Coming: An Economic Cold War	7
NEWS OF INDUSTRY	
*Special Report: How Realistic Is U.S.	
Steel's Labor Policy?	51
*Distribution: Can You Use Steel's New	
Color Coding Method?	55
*Purchasing: How to Buy Better Screw Products *Production: Why Change To All-Basic	56
Openhearth Roofs?	57
*Marketing: Try Chemicals as Market	58
*Pricing: How London Metals Exchange Works	60
NEWS ANALYSIS	
Newsfront	41
Report to Management *	65
*Automotive Assembly Line	68
*This Week in Washington	73
*West Coast Report	77
*Machine Tool High Spots	79
TECHNICAL ARTICLES	
	91
*Glass Mold Smooths Casting Wrinkles	95
*Giant Machines Strengthened by Welding *Precision Assemble With Base Plates	98
Four Grinders Automate Crankpin Line	10
*New Technique Eases Soldering	102
*Bearings Convert Old Machines to Ultraspeeds	104
MARKETS & PRICES	
*The Iron Age Summary—Steel Outlook	145
Steel Product Markets	146

#### REGULAR DEPARTMENTS

Iron and Steel Scrap Markets ...

Steel Prices .....

Comparison of Prices

Dates to Remember		13
Free Literature		
New Equipment		134
INDEX TO ADVERTI	FRS	172

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#### NEWS DEVELOPMENTS

#### NEW STEEL COLOR

CODING METHOD STARTED Ryerson takes plunge with new sys-

tem of marking steel bars and plate. It may be answer to consumer's plight in view of increasingly complex specifications. System gives purchaser tricolor system to determine carbon range, family series, and surface.

#### HOW TO BUY BETTER

SCREW PRODUCTS P. 56

Machine screw products customers can cut costs and improve results by closer liaison with producers. Purchasing agents can do a better job of procurement by more attention to detail of screw products orders. Industry's Buyers' Guide may help.

#### SHIFT TO ALL-BASIC

**OPENHEARTH ROOFS** 

Favorable production and maintenance figures over two years' use of basic refractory material in one furnace roof encourages an Illinois metalworker to convert all his openhearths, standardize on all-basic bricks. Others report up to 10 pct increase in steel output, no advance in fuel costs.

#### B-52'S MAY GET INSIDE

PRODUCTION TRACK

P. 73

With backing of Sec. Wilson, B-52's may get go-ahead on materials and engineering. Shortages and "bugs" have held down number accepted by Defense Dept. Wilson and Gen. Le May want to increase size of wings from 30 to 45 planes.

#### TURBINE PUMP SALES PRIMED

BY IRRIGATION FARMERS

P. 77

Development of ground water supply by West Coast farmers for irrigation purposes assures pump suppliers 1956 sales will top last year's \$75 million record by a good margin.



JOHN A. STEPHENS, vice president of industrial relations, U. S. Steel Corp., is a strong personality in steel labor negotiations. He's been under the gun for years. See story, P. 51.

#### DEFENSE TOOLING PLAN IS ON THE SPOT

Tool builders think there's too much talk and not enough action on new tooling program. Situation has been muddled since Vance Plan was abandoned. Builders say way is clear to buy new tools and put older ones into reserve category. But plan may lag on appropriation problem.

P. 79

P. 91

P. 95

#### FEATURE ARTICLES

#### CAST CLOSE TOLERANCES IN GLASS MOLDS

As refractories go, glass is a natural. All-in-one glass molds offer top precision, finer casting definition, and a blemish-free surface finish. All this plus versatility permitting both ferrous and nonferrous casting. Chemically inert, glass boasts an extra low coefficient of expansion, for tight tolerances. Its short firing cycle drastically cuts firing time.

#### GIANT MACHINE WELDED FOR STRENGTH

How do you straighten armor plate 20 in. thick and 50 in. wide? A mammoth press obviously, but how to justify its cost when repeat orders are highly improbable? Weld-fabricated construction answered the problem for one metalworker. He got delivery, better strength to weight ratio in a 36 ft high, 5000 ton hydraulic press with a 118 ton bed.

#### SASE PLATE ASSEMBLE FOR PRECISION

Assembling on base plates solves many ticklish problems in producing precision instruments, such as watches. Control of alignment, parallelism, profiling and hole location spectacularly improves. The technique economizes in mass production of industry's most finicky assemblies.

#### GRIND-TINNING IMPROVES

SOLDERABILITY

Here's a comparably new technique for simplifying ordinarily tough soldering jobs. Even glass, wood, and ceramics solder easily, as do aluminum, stainless steel and titanium. Secret is grind-tinning, where a solder-coated abrasive wheel roughens

the surface, tins simultaneously.

P. 102

P. 104

P. 58

#### NEW BEARINGS SPEED TO

siderably less importance.

Now you can take fuller advantage of cutting potential in carbides and ceramic tools without costly investment. New bearings need no special lubricants, or gear trains, yet turn spindles at 500,000 rpm. Lower speeds too, up to 70,000 rpm with a 3600 rpm motor. Conversion is simple, and reversible, with machine rigidity of con-

#### MARKETS AND PRICES

#### CHEMICALS ARE A MARKET FOR METALWORKING

The ever-expanding chemical industry provides a good market for metal-working. \$2.3 billion expansion looked for in 1955-57 period. Metalworkers will share in new plants and equipment.

#### HOW LONDON METALS EXCHANGE

Every weekday men meet in London and haggle over price of shipments of copper, tin, lead and zinc. Whether they finally agree or not their actions will be reflected in price domestic consumers will pay for their metal. It's the London Metals Exchange, world's oldest metal commodity market

#### LAGGING AUTO SALES CAUSE FOR CONCERN P. 68

Some auto industry executives are hoping the threat of increased prices will spur consumers to buy up cars jamming showrooms, instead of waiting for 1957 models. Poor sales so far are blamed on late spring, tight credit

#### STEEL LABOR NEGOTIATIONS WILL BE ROUGH

Odds for a peaceful settlement of steel labor talks appear to be growing short. Some steel leaders are making strong talk against repeated advances in labor costs. Steel market has many strong points.

P. 145

P. 152

#### U. S. SITUATION NEXT

Although foreign developments have been favorable, copper outlook is not rosy yet. Mine, Mill & Smelter Workers Union being challenged by United Steel Workers. Battle could result in crippling strikes.

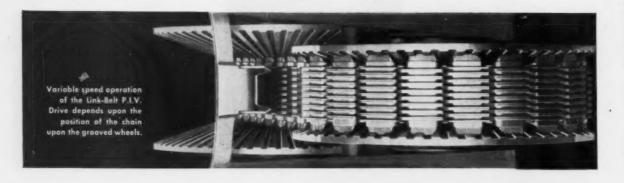
#### NEXT WEEK:

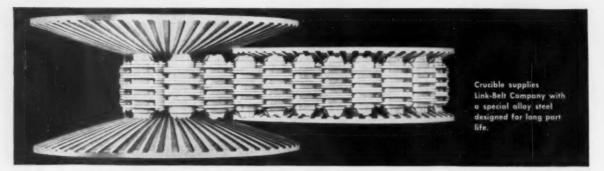
#### CHICAGO: \$10 BILLION METALWORKING HUB

Dollar value of metalworking output in Chicago area rose to \$10 billion last year. This industrial beehive has come a long way since the cow kicked over Mrs. O'Leary's lantern. Read about it next week.

#### PACKAGED SETUPS BOOST MACHINING OUTPUT

Setups waste time that should be devoted to making chips. The problem's of long standing, but can be solved. Here's one firm's answer that you too can apply. After reading it next week, expect to get more output per machine.

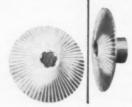




these

#### SPECIAL ALLOY STEEL PARTS

keep Link-Belt's P.I.V. Drive on the job



Keeping production operations going at the right speed is the job of this variable speed drive unit produced by Link-Belt Company. Its operation is based on an exclusive drive chain with self-forming metal teeth, which engage with radial grooves in two pairs of cone-shaped wheels.

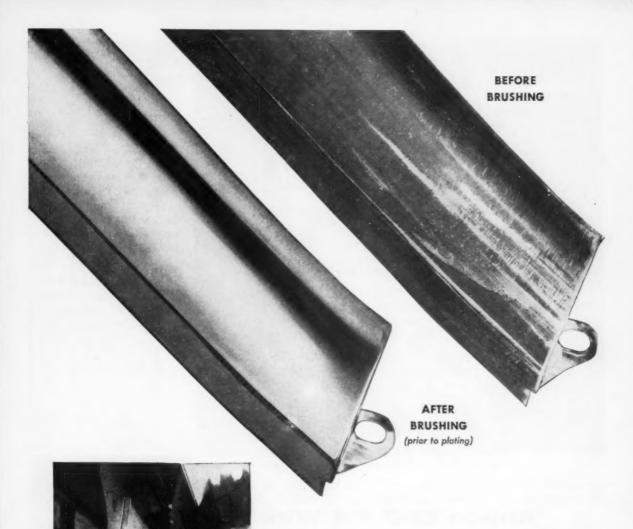
To make these precision wheels requires a steel that can be readily machined, will not distort, and which has high-strength. That's why Crucible furnishes Link-Belt with a special Nitriding BM alloy steel designed for this application. After machining the wheels are Nitrided to obtain a minimum surface hardness of 1000 Vickers Diamond Brinnel — about the hardest surface that can be obtained commercially.

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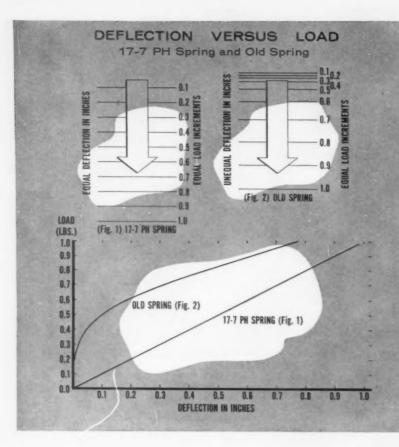
An Osborn Brushing Analysis of your other finishing operations may point up additional ways power brushing can help improve quality. Write The Osborn Manufacturing Company, Dept. F-45, 5401 Hamilton Avenue, Cleveland 14, Ohio.

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(Fig. 1). The 17-7 PH spring deflects equal increments with each additional 0.1 pound load. The first 0.1 pound deflects the spring almost exactly the same amount as the last 0.1 pound.

(Fig. 2). The old spring deflects unequal increments. Deflection at the first 0.1 pound load is entirely different from the last.

## Armco 17-7 PH Wire Solves Stacker-Spring Problem at Lowest Cost



Ideal physical properties and relatively low cost made Armco 17-7 PH Stainless Steel wire top choice for stacker-springs in a new 1000-card-a-minute sorter.

Stacker-springs on this rapid-fire equipment had to have zero initial tension. This meant no pressure between turns at no load. In addition, the springs were required to have a constant stacking rate . . . deflect proportionately for each equal load addition and have close tolerances.

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#### EDITORIAL

#### Coming: An Economic Cold War!

 WE ARE ABOUT TO HAVE a new foreign policy. The truth has finally hit us: the Russian Communist bosses have made a lot of hay around the world in the past year-at our expense.

In a violent rage at London recently, Red boss Khrushchev indicated that he has not really changed. Yet millions of Americans again believe things are "different." It must be wishful thinking that allows us to be taken in that way.

Much time may be lost before we realize how much our relations with the rest of the world are being challenged. Not only have we a top defense position to maintain; we now face a major worldwide economic fight with the Communists.

When Khrushchev and Bulganin act like a rough and tumble oldtime vaudeville team, we are often blind to their successes. What we don't see is their sly and diabolic pandering to an unconscious anti-American feeling that often prevails abroad.

After all, "rich uncles" are not always loved for themselves alone. Nations are no different than persons. No one likes to be lectured to, told how to run his country-or his business.

The Russian Reds have made so much heavy industrial progress that they can talk and act like international big shots—and they do. Those they are "reaching" forget that in order to be the second most powerful nation in the world-and still growing-the Kremlin masters have ground down the people, murdered millions, enslaved millions more and starved their country in one field to become massive in another.

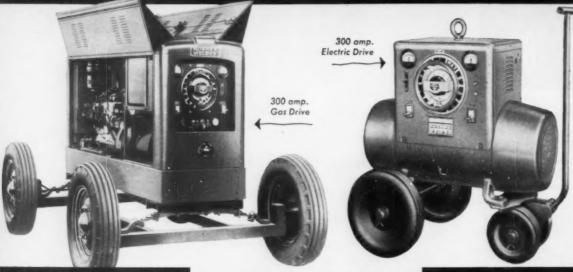
What does this mean to you and me? Whether we like it or not, we are embarked on another phase of the defense cold war-an economic cold war. It has to be carried out on top of a speeded up security program. It is an even bigger job; we must help and support other nations without giving the impression that we are trying primarily to save our own skins.

We will be required to match the Reds with words, do better deeds and hope to wind up eventually better understood by those whom we seek to protect from Communism. But we must not believe that the Reds have changed their charted course to world domination!

Tom Campbell

EDITOR-IN-CHIEF

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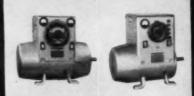
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#### Salesman Sends Thanks

Sir.

I could dictate a very flowery speech about the importance, impact, understanding, penetration etc. of your April 19 editorial, "Salesmen Are People Too!", but instead I should just like to say thanks. Yes, thanks, for organizing the many thoughts of many salesmen making their thinking a little more coherent for each day, week, or year's labor.

"Belongs" is a great word in any society and criticism is a factor mose salesmen welcome. J. E. Drylie, Eastern Representative, Thomas Machine Mfg., Co., Phila., Pa

#### Far Away Reader

Sir:

Your September 1, 1955, article, "New Radiant Furnace Continuously Melts Aluminum," interested me very much. I would like to know whether Selas Corp. would be interested in undertaking the design of this furnace for another country.

We want to use this furnace to melt aluminum ingot for casting into slabs for rolling and billets for extrusion. We are using a DC casting machine with a daily capacity of 40 tons. Before casting, we want to go into the degassing process with chlorine as a degassing agent. We use heavy oil as fuel.

We want to know the cost of this equipment and its design. Please give us more details. Dr. Ing Y. C. Cheng, Chief Engineer, Taiwan Aluminum Corp., Taiwan, China.

We are passing along your letter to Selas Corp.—Ed.

#### **Welding Dollar**

Sir:

Please send three copies of your article: "How to Get More For Your Welding Dollar", for general distribution among our key personnel. P. A. Repino, Plant Engineer, Lebanon Steel Foundry, Lebanon, Pa.



Arc Welding Magnesium

Sir:

Will you please forward to the writer two copies of "How to Get More For Your Welding Dollar" as published in The Iron Age of April 26, 1956? C. H. Rathmell, Jr., Design Engr., Sprout, Waldron & Co., Inc., Muncy, Pa.

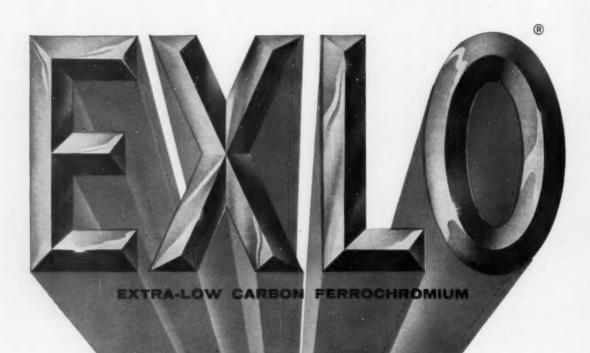
#### Alcoholism and Industry

Sir.

I would appreciate your sending me three or four reprints of the article entitled "Alcoholism" in the April 19 issue of your magazine.

If there is anything I can do within our company to help other victims I certainly want to be in shape to do so. G. P. Gentry, Phillips Petroleum Co., Bartlesville, Okla.

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#### fatigue cracks

by William M. Coffey

#### A Summary is a Summary

A new feature we started in this column last week is a series that will give you a behind-the-scenes look at the various sections of your IRON AGE. From time to time there'll be more. Such as the following:

On p. 145, where it leads off the Markets & Prices section, you'll see a few hundred words labeled "THE IRON AGE SUMMARY." Someone once asked if it were a summary of the news in each issue. Nothing could be further from the truth.

#### Strictly Confidential

Actually, it is a distillation of several thousand words of reports from district editors and correspondents. These reports are pretty blunt as they clatter in each Monday by teletype from our district offices. They tell what mills are over-extended on plates, where a mill breakdown will hold up deliveries, who is raising prices, what order books look like and what about cancellations. And also, who is cancelling, where and how much tonnage (if any these days).

Getting in to buyers and mill sales offices on a confidential basis takes time. It means these people must know from years of experience that no confidence will be revealed. But it does help to know what companies expect to boost their cold-rolled sheet orders by how much in the next quarter, what auto companies are planning, what their inventories look like.

News-Markets Editor John Delaney collects all these detailed reports, makes a few calls to his own contacts, double checks with district editors where any area looks hot. His job, then, is to reconcile and digest this data, protect all our sources, and come up with a summary of it—all in some 400 words. You see now where we get the word "Summary."

Tis is the page, if you'll pardon a little family pride, where IRON AGE readers have seen more predictions, and more accurate predictions, about business trends, strikes, steel price boosts, etc., than in any other place.

#### Old Wire Tale

Casting about for something to dramatize its 100th anniversary, the New England wire firm of George W. Prentiss & Co. came up with an article which THE IRON AGE ran when Prentiss celebrated its 70th birthday. Here's an item from that reprint — a quote of a letter founder Prentiss wrote to a customer on April 8, 1863:

The prices of all kinds of wire continue to be as high as at any time yet. Demand . . . is more than manufacturers can supply. I had a letter this week from a Worcester (wire) manufacturer asking me to put my prices up. . . . I shall not put the price of wire up unless stock goes up, whatever the demand."

#### **New Puzzler**

Many thanks to John M. Talbot, an old reliable, for this one:

A man has \$1.00 to spend to take a group of people into a show. He can take 10 children for 1¢, a woman for 2¢ and a man for 5¢. How does he distribute the attendance so at the end he has spent \$1.00 and 100 individuals attended?

#### Old Puzzler

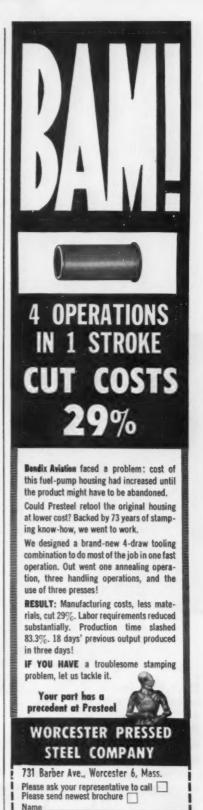
Answer to the April 19 helicopter blade problem is that one blade will cost  $xy \div z$ . At least this is the unanimous opinion of General Steel Castings Corp.'s IA Puzzle Solvers Club, E. H. Watkins, Lois Michel, Ole Darcey and the fellow who sent it in in the first place.

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#### dates to remember

#### MAY

COPPER & BRASS RESEARCH ASSN.— 34th annual meeting, May 13-16, The Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

THE NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS—46th spring meeting, May 14-15, Hotel Roosevelt, Pittsburgh. Assn. headquarters, 1900 Arch St., Philadelphia.

NATIONAL ASSN. OF WASTE MATE-RIAL DEALERS, INC.—Spring meeting, May 16. The Sheraton-Astor Hotel, N. Y. Society headquarters, 271 Madison Ave., N. Y.

#### EXPOSITIONS

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

THE SOCIETY OF THE PLASTICS IN-DUSTRY, INC., June 11-15, New York City.

ASSN. OF IRON & STEEL ENGINEERS, Sept. 25-28, Cleveland.

METAL SHOW-Oct. 8-12, Cleveland.

PORCELAIN ENAMEL INSTITUTE— Midyear divisional conference, May 16-17, Edgewater Beach Hotel, Chicago. Society headquarters, 1346 Connecticut Ave., N.W., Washington 6, D. C.

SOCIETY FOR ADVANCEMENT OF MANAGEMENT — Materials handling conference, May 17-18, Hotel Statler, New York City. Society headquarters, 74 Fifth Ave., N. Y.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN. — Annual convention, May 20-23, Atlantic City, N. J. Society headquarters, 2130 Keith Bidg., Cleveland.

WIRE REINFORCEMENT INSTITUTE

-Annual spring meeting, May 28-30,
The Greenbrier, White Sulphur Springs,
W. Va. Society headquarters, National
Press Bldg., Washington 4, D. C.

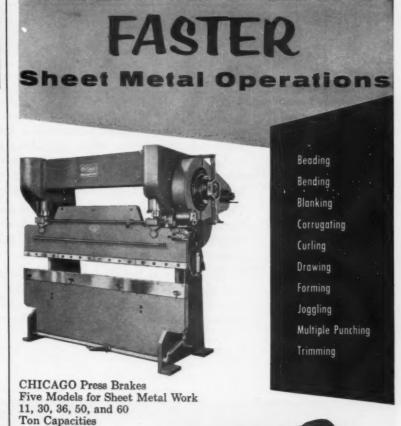
CONCRETE REINFORCING STEEL IN-STITUTE—Annual meeting, May 28-June 2, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 39 S. Dearborn St., Chicago.

STEEL JOIST INSTITUTE — Annual meeting, May 29-30, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Dupont Circle Bidg., 1346 Connecticut Ave., Washington, D. C.

#### JUNE

AMERICAN GEAR MANUFACTURERS ASSN.—40th annual meeting, June 3-6, The Homestead, Hot Springs, Va. Society headquarters, Empire Bidg., Pittsburgh 22, Pa.

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Summer meeting, June 3-8, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters, 29 W. 39th St., N. Y.



CHICAGO Straight-Side and Gap Presses with Large Die Area for blanking, punching, trimming, and shallow drawing. Custom built to individual requirements in stroke, die space, and bed area.



Descriptive Literature on request





Press Brakes · Straight-Side Presses · Press Brake Dies

Hand and Power Brakes . Special Metal-Forming Machines

## DREIS & KRUMP MANUFACTURING CO.

7430 South Loomis Boulevard, Chicago 36, Illinois

CF&I is one of America's most diversified producers of steel products. For today's CF&I organization was formed from many steel companies, companies which specialized in serving certain industries and certain areas. Because most of these companies had set the quality standards in their own fields for years, many of their brand names have been retained for your convenience.

This is as it should be. These brand names still guarantee you satisfaction and quality. You have the added assurance that comes from knowing that these products are made under CF&I's exacting quality control—from ore to finished product.

In addition, you benefit from CF&I's efficient, nation-wide organization which gives you ever-available sales engineering services as well as prompt delivery. Next time you're in the market for steel or steel products, it'll pay you to contact CF&I.



THE COLORADO FUEL AND IRON CORPORATION

DENVER . OAKLAND . NEW YORK

#### CFAI FABRICATING PLANTS

The quality of CF&I steel products is firmly controlled since the requirements of each product determine the analysis of the steel.

#### CFal Buffalo, New York

Fine and Specialty Wire of all types including Manufacturer's Wire (Basic, Spheroidized, Annealed, Tempered, Bright and Liquor Finish, Low and High Carbon)—Welded Wire Fabric—Chain Link Fence—Golvanized Strand.

#### **CF&I** Claymont, Delaware

Flanged and Dished Heads—Carbon and Alloy Steel Plates—Stainless-Clad Plates—Nickel Lectro-Clad Plates—Manhole Fittings and Covers—Large Diameter Welded Steel Pipe—Flame Cut Steel Plate Shapes.

#### CFal Clinton, Mass.

Poultry Netting—Hex Mesh Nettings—Hardware Cloth—Industrial Wire Cloth—Alloy Processing Belts—Perforated Metals—Overhead Conveying Equipment—Sliding Door (Industrial) Hardware.

#### CF&I Mt. Wolf, Pennsylvania

Insect Wire Screening and Industrial Wire Cloth.

#### CFal Oakland, Calif.

Fish and Crab Trap Netting—Stucco Netting—Poultry Netting—Hardware Cloth—Industrial Wire Cloth—Straightened and Cut Wire—Reinforcing Tie Wire—Mechanic's Wire—Chain Link Fence—Crimped Wire.

#### CF&I Palmer, Mass.

Wire Rope—Wire Rope Slings—Wire, all types (see Buffalo Plant)—Wire Clothesline—TV Guy Wire—Aircraft Control Cable.

#### CFal Pueblo, Colo.

Bar, Rod and Structural Products—Grader Blades and Cutting Edges—Rails and Accessories—Chain Link Fence—Woven Wire Fence—Fence Stays—Fence Posts—Corn Cribs—Welded Wire Fabric—Nettings—Grinding Balls and Rods—Screen and Grizzly Bars—Rock Bolts—Galvanized Strand—Clothesline—Barbed Wire—Manufacturer's Wire (Basic, Chain, Spring, Stapling, Weaving, Welding)—Merchant Wire (Annealed and Galvanized)—Nails—Bolts—Nuts—Spikes—Seamless Casing and Tubing.

#### CFal Roebling, N. J.

High Carbon Steel Wire (Hard Drawn, Spheroidized and Tempered)—Rope Wire—Tire Bead—Hose Wire—ACSR Core Wire—High Carbon Spring Steel Wire (All grades, tempers and finishes)—Regulator, Sash Balance and Flapper Valve Wire.

#### CFal Roebling (Trenton), N. J.

High and Low Carbon Flat Wire (All tempers, edges and finishes)—Brush, Corset, Casing, Heddle and Drop Wire, Umbrella Wire and Tape Lines—Wire Rope—Strand, Aircord and Fittings—Wire Rope Slings—Electrical Wire and Cable and Magnet Wire.

#### CF&I So. San Francisco, Calif.

Galvanized and Annealed Merchant Wire—Galvanized and Annealed Stone Wire—Bale Ties—Baling Wire—High and Low Carbon Wire—Galvanized and Annealed Wire—Copper Coated Wire—Rope Wire—Welding Wire.

#### CF&I Worcester, Mass.

Valve and Clutch Springs—Starter Springs—Tire Chain Adjusters—Cross Chain Repair Links—Mechanic's Wire—Compression, Extension and Torsion Springs of all types—Formed Wires.

## STEEL PRODUCTS

#### CF41 STEEL PRODUCING PLANTS

#### CF&I Pueblo, Colorado

Blast Furnaces and Open Hearths producing pig iron, ingots, blooms, billets and rods.

#### CFal Buffalo, New York

Blast Furnaces and Open Hearths producing pig iron, ingots, blooms, billets and rods.

#### CF&I Claymont, Delaware

Open Hearths producing ingots and steel plate.

#### CF&I Roebling, New Jersey

Open Hearths producing ingots, blooms, billets, and rods.

#### CF&I Brooke, Pennsylvania

Blast Furnaces producing basic, Bessemer, foundry, malleable and low phosphorus pig iron.

3491

#### REPEAT ORDERS

...the true measure of Customer Satisfaction



#### NORRIS-THERMADOR CORPORATION

#### has re-ordered Lake Erie Presses nearly 40 TIMES

Ask about 16mm, sound, color film "Pressure on Metalworking Production".



No endorsement for a product is more convincing than a repeat order . . . unless it is dozens of repeat orders! Norris-Thermador purchased its first "Lake Erie" in 1940 and has since run the total to more than 80 presses. In a recent letter, Mr. Kenneth T. Norris, President of Norris-Thermador Corporation, said: "It has now been fifteen years since we installed our first Lake Erie hydraulic press and it is still operating day in and day out in an entirely satisfactory manner."

#### LAKE ERIE ENGINEERING CORP.

General Offices and Plant: 368 Woodward Ave., Buffalo 17, N.Y. District Offices in New York, Chicago, Detroit, Pittsburgh Representatives in other U. S. Cities and Foreign Countries

LAKE ERIE® • Manufacturers of die casting machines and the most complete line of hydraulic presses for all industry.

0

THE IRON AGE



Mr. Motorist:

made of
Stainless
Steel?

why are the wheel

Because nothing less than true stainless steel gives you the beauty that smiles at exposure . . . the strength that shrugs off years of highway hazards! Down where the going is roughest, stainless wheel covers stay bright and unblemished despite destructive road chemicals, flying grit, cinders and gravel—proving the point that for every automotive application where timeproof, carefree brilliance is desired, stainless steel is the metal of choice. Look for it, everywhere!



SUPERIOR STAINLESS STRIP STEEL



**Superior Steel** 

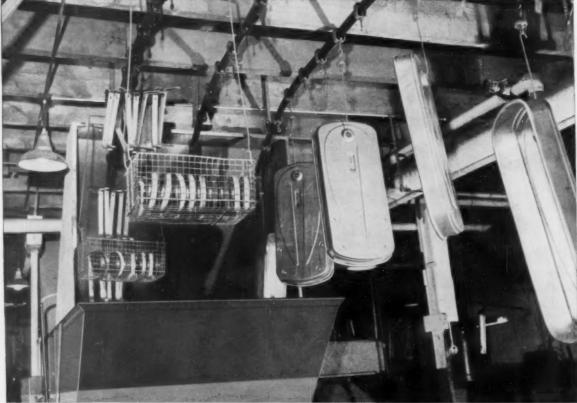
CORPORATION

CARNEGIE, PENNSYLVANIA



#### Dow . . . industry's most complete line of chlorinated solvents





Higher boiling point of DOW PERCHLOROETHYLENE gives parts longer, more thorough cleaning action before parts' temperatures reach that of the vapor. This is a particular saving when tough contaminants like waxes and buffing compounds are being removed.

It's a smooth, no-repeat operation when you're running on highly stable

#### DOW PERCHLOROETHYLENE

Continuous monorail or cross rod conveyor units need an exceptionally stable solvent to deliver "one stop" vapor degreasing. The major value of these high-speed units is lost if improper solvent fails to degrease parts thoroughly, forcing reruns.

High-boiling DOW PERCHLOROETHYLENE answers this problem with stability to spare. You can't find a solvent with greater resistance to thermal breakdown or deterioration from light and oxygen. This stability *plus* prevents decomposition of DOW PERCHLOROETHYLENE that would harm the units or the

load. And this solvent's greater vapor density holds vapor loss far lower.

Contact your local Dow distributor today for a profitable fill-in on how you could use this efficient, safe vapor degreasing solvent. You'll want to ask him about "work horse" DOW TRICHLOROETHYLENE, METHYLENE CHLORIDE and sensational, cold-cleaning CHLOROTHENE\*, too. For detailed technical information on any of these solvents. just drop a line to the DOW CHEMICAL COMPANY, Dept. S-942A, Midland, Michigan.

\*Trademark of The Dow Chemical Company

you can depend on **DOW CHEMICALS** 







LATEST GEAR-O-MATION® equipped Michigan 870 gear shaver finishes 18-tooth automotive pinions at 260 per hour. Features are: hopper feed, automatic load and unload, pneumatic headstock and tailstock, 3-way classifier with automatic feedback maintaining correct center distance, desired accuracy and production requirements preset on control panel, more accurate gears produced.



10

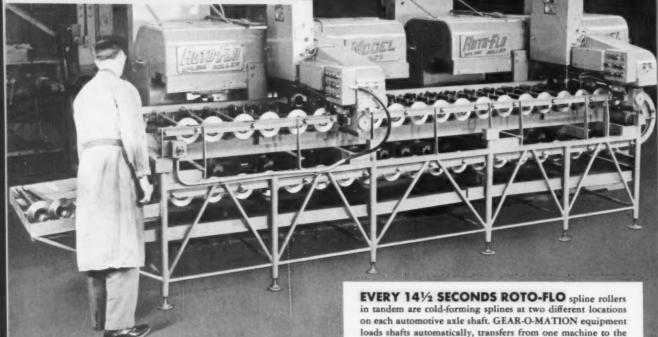
MACHINE TOOL BUILDER shaves a wide variety of gears (a few are shown) on this Michigan 870-A gear finisher. Underpass is used for shoulder cluster gears, while the transverse method, in combination with crowning, is favored for shaving wide face spur and helical gears.

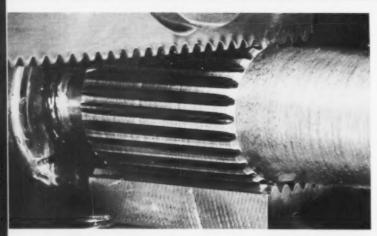
This 870-A has an 18-inch capacity, which covers practically all requirements for this Illinois firm.

## TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.







ROTO-FLO FORMED SPLINES, just coming off the forming racks. Actual forming process takes 4 or 5 seconds—floor to floor time is 10 to 15 seconds. Cumulative spacing error is less than .0015 inch—compare it to your present spline manufacturing.



7171 E. McNICHOLS RD. . DETROIT 12, MICH. IN CANADA: COLONIAL TOOL CO., LTD.



other, returns double-splined shafts to the operator.

COLD-FORMED HELICAL TEETH (by ROTO-FLO process), as shown here, have a very high degree of accuracy. Note the sharp, square corners at the top of the teeth, the 3 to 6 micro-inch finish on the tooth form. Compare the few seconds required to produce parts like these with your present production on similar parts.

## The man's no midget

He's 6 feet tall and the lathe is the heaviest and most powerful general purpose lathe ever built in the U.S.A.

Consolidated built it of course, and the price (if you are interested) is around a half million dollars.



a half-

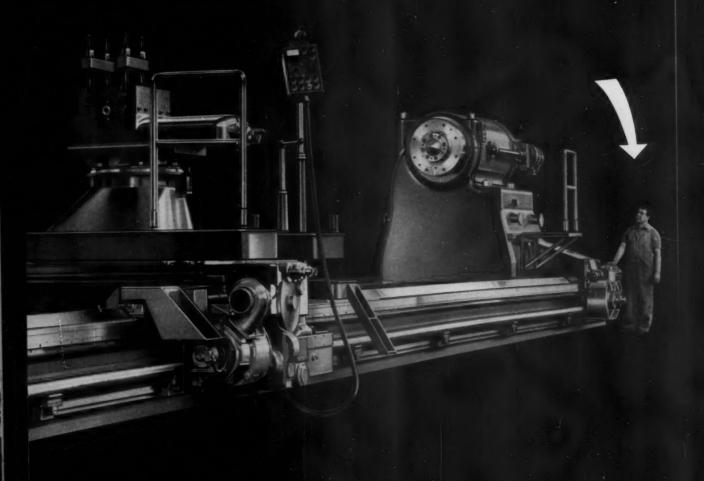


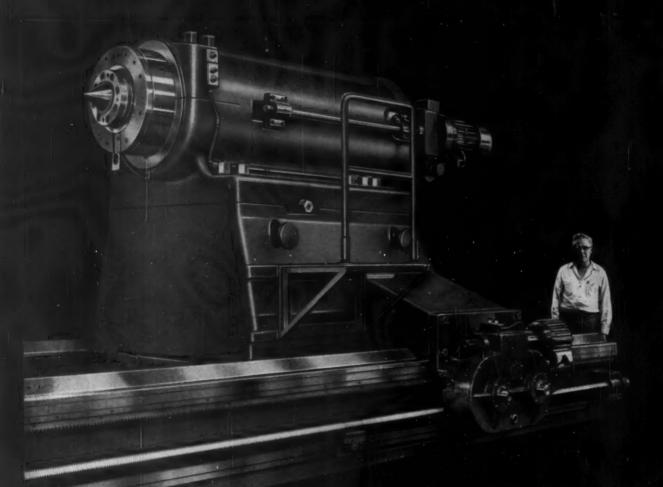
### million dollar lathe

... the heaviest and most powerful ever built in America!

Some highlights on the new 12 foot BETTS HEAVY DUTY LATHE:

- The head and tail stock centers alone (without steady rests). will support work pieces weighing up to 250 tons!
- The big super-precision spherical roller type spindle bearings are 36 inches in diameter!
- The lathe shown (60 foot centers) weighs 245 tons.
- The front way of the bed is nearly 3 feet wide.
- · The taper attachment turns tapers up to 14 feet long in one setting!
- The head stock is built for a 250 HP driving motor.





## the 30 ton tail stock

Its huge live center revolves in precision roller bearings nearly two feet in diameter.

These lathes are big, but more than bigness is the quality of engineering thinking that goes into them.

For example, this big lathe is electronically controlled. The operator runs it at the cutting tools with his eyes on the cut. Infinitely variable feeds and speeds are on a portable panel at his finger tips and he can

change them in fine increments while the tools are cutting! Power traverse is there, too. There are also such features as the adjustable spring loaded tail stock spindle that compensates for the elongation of the work piece as its temperature rises.

This is the kind of thinking that goes into Consolidated Machine Tools.

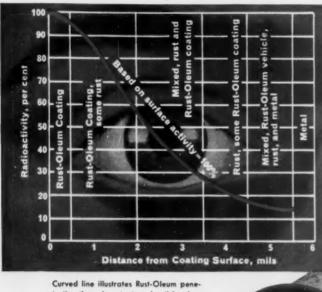
#### CONSOLIDATED MACHINE TOOL CO.

ROCHESTER, NEW YORK



A DIVISION OF FARREL-BIRMINGHAM CO., INC.

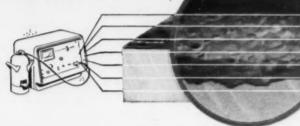




Rust-Oleum dries to a firm, decorative coating that resists salt water, sun, fumes, heat, humidity, and weathering.



tration through rust at each mil level as recorded by Geiger Counter.



Geiger Counter traces Rust-Oleum penetration to bare metal! In nearly three years of radioactive research, Rust-Oleum's specially-processed fish oil vehicle was radioactivated and formulated into Rust-Oleum 769 Damp-Protof Red Primer — then applied to rusted test panels. Rust-Oleum's specially-processed fish oil vehicle was then traced through the rust to bare metal by Geiger Counter.

This penetration means rust-stopping power, because the fish oil vehicle works its way into the tiny pits in the metal where it drives out air and moisture that cause rust. Important savings are yours, because Rust-Oleum can be applied directly over sound rusted surfaces – usually eliminating costly surface preparations. Attach coupon to your business letterhead for your copy of the thirty-page report entitled, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust On Steel Specimens," prepared by Battelle Memorial Institute technologists. Prompt delivery of Rust-Oleum is assured from your nearby industrial distributor.



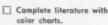
There is only one Rust-Oleum. It is distinctive as your own fingerprint.

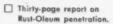


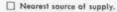
tust-Oleum is available in practically all colors, ncluding aluminum and white. See our complete catalog in Sweets, or write for information.

#### ATTACH TO YOUR LETTERHEAD-MAIL TODAY!

Rust-Oleum Corporation 2564 Oakton Street Evanston, III.









Freedom from deep surface defects scores a point for Pittsburgh tubes. Absence of defects holds down rejects, speeds up production.

#### **Steel That Stones Polish**

Pittsburgh Steel Tubes Help Ohio Honing Establish Unusual Claim— Firm Hones Hydraulic Cylinders With No Preliminary Machining

Al Blewett, president of the Ohio Honing & Hydraulic Company, proudly claims his Cleveland, Ohio, plant is one of the few in the country where seamless mechanical tubing is honed internally and externally without first being bored, ground or turned.

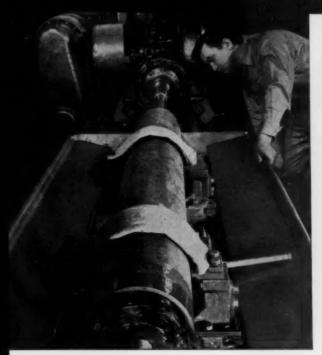
The details of his technique and

special equipment are Mr. Blewett's secret—but he is quick to say that quality tubing from Pittsburgh Steel Company plays an important role.

Ohio Honing, which makes a specialty of honing, uses Pittsburgh tubes to make cylinders for air and hydraulic cylinder customers throughout the United States and

Canada. The company processes tubes for some customers and also produces complete air and hydraulic cylinders for other customers to their specifications.

Ohio Honing makes cylinders as small as 6 inches long while its largest cylinders measure up to 30 feet long. The 6-inch cylinder has an in-



Internal Honing. The operator is removing .045 inch from this  $7\frac{1}{2}$  inch I.D. Pittsburgh tube. The tube is  $58\frac{1}{2}$  inches long and has a wall thickness of  $\frac{3}{8}$  inch.



Before and after internal and external honing. Al Blewett, president of Ohio Honing, left, checks a finished tube with Office Manager Kenneth Sherman.

side diameter of one inch and the 30foot cylinders have a 24-inch inside diameter.

Mr. Blewett declared the consistent high quality of the seamless mechanical tubing made by Pittsburgh Steel is so important to his operations that he recommends them to customers for whom he does honing work only. Pittsburgh tubes also are his choice for cylinders which he starts and finishes in his own plant.

• Requires "Perfect Finish."
"We must have tubing without defects so that .035 to .045 inch honing will give us a perfect finish," declared Mr. Blewett. "Our scrap on tubes is very low because Pittsburgh Steel tubes are unusually free of defects."

Approximately 7,000 tubes pass through Ohio Honing's plant every month. Many of them get both internal and external honing. Yet the number of scrapped tubes is negligible.

That low rejection rate makes Pittsburgh tubes a prime favorite with Ohio Honing. Mr. Blewett also gives them a high score on concentricity, straightness, and weldability on automatic welders.

"And we can get the tubes we want in standard sizes which are readily available," he pointed out.

Excellent performance in produc-

tion and high quality in the finished product are assured when you use Pittsburgh tubes in your tubing application. Let Pittsburgh tubes prove themselves on your production line.

Just ask a Pittsburgh Steel representative to call on you or write now for the new tubing handbook.

#### Pittsburgh Seamless Mechanical Tubing is also available from:

Baker Steel & Tube Company Los Angeles, California

Chicago Tube & Iron Company Chicago, Illinois

The Cleveland Tool & Supply Co. Cleveland, Ohio

Drummond McCall & Co., Limited Montreal, Quebec, Canada

Edgcomb Steel Company Philadelphia, Pennsylvania

Gilmore Steel & Supply Co. San Francisco, California

Earle M. Jorgensen Co.

Mapes & Sprowl Steel Co. Union, New Jersey

Metal Goods Corporation St. Louis, Missouri Miller Steel Company, Inc. Hillside, New Jersey

A. B. Murray Co., Inc. Elizabeth, New Jersey

C. A. Russell, Inc. Houston, Texas

Ryerson, Joseph T. & Son, Inc. Chicago, Illinois

Solar Steel Corporation Cleveland, Ohio

Steel Sales Corporation Chicago, Illinois

Tubular Sales Detroit, Michigan

Ward Steel Co.
Boston, Massachusetts

Ward Steel Service Company Dayton, Ohio

## **Pittsburgh Steel Company**

Grant Building · Pittsburgh 30, Pa.

District Sales Offices

Cleveland

Atlanta Columbus Chicago Dallas

Dayton

Detroit Houston Los Angeles New York Tulsa Philadelphia Warren, Ohio Pittsburgh



## REPUBLIC CHATEAUGAY



Electrical fittings cast from Chateaugay Pig Iron are accurately machined for perfect threads and alignment. The use of Chateaugay increased tap and die tool life 35%.



This Gedney Conduit Body, cast from Chateaugay, features toughness, resistance to impact, excellent ductility, easy and uniform machinability. Body finish is smooth and free of gatemarks, burrs and sharp edges.

## REPUBLIC



World's Widest Range of Standard Steels

## PIG IRON...

## die tool life 35% for manufacturer.

Here's an outstanding example of how Chateaugay, Republic's exclusive premium Pig Iron, helps a manufacturer maintain a profitable position in a highly competitive market where price margins are extremely thin.

The Andrew Terry Company, Terryville, Conn., manufacturer of Gedney Electrical Fittings, was faced with the problem of producing high-quality, malleable cast iron fittings at the lowest possible price. Most of the fittings are machined, either tapped or die-threaded, to permit electricians to make fast on-the-job assembly with conduit, such as Republic Rigid Conduit.

In an attempt to keep costs down, ordinary pig iron was used in the cupola mix. This often resulted in porosity due to excessive shrinkage and open grain structure. Further difficulty was encountered during threading of the fittings. Hard spots in the castings cut the tool life of taps and dies to about 65% of expectancy.

Then, The Terry Company switched to Chateaugay Pig Iron with these distinct advantages as the result: (1) Tough, sound castings accurate to patterns and shapes having relatively thin wall sections. (2) A fine, uniform grain structure that provides better machinability. So much better that tool life has been increased 35%. (3) High tensile strength with resistance to heavy impact. (4) Excellent ductility.

These and other advantages of Chateaugay, the lowphosphorus, copper-free Pig Iron, can be applied to your production. A Republic Pig Iron Metallurgist will give you the complete facts. His service is confidential and without obligation. Just send the coupon.

## STEEL

and Steel Products

In your foundry operation with Republic Chain Stings. Available in Alloy Steel, High Test Steel and Wrought Iron, each chain sling is designed, tested and warranted for

INCREASE LIFTING EFFICIENCY

the highest degree of safety, Because each type has a specific use, we recommend talking over your requirements with a Republic Chain Engineer. Or send coupon for literature.





INCREASE HANDLING EFFICIENCY with Republic Materials Handling Equipment. Here, PB-120-T Box and Skid Units, equipped for tiering, provide ready accessibility to finished castings . . . permit visible identification and accurate inventories. Republic Materials Handling Specialists will help you design units for your specific needs. Write for Catalog on the complete line.



INCREASE STORING EFFICIENCY of patterns and dies with Republic Wedge-Lock Steel Shelving. Specifically designed for high stacking of enormous weights, joints actually get tighter as weight increases. There's no distortion or instability. Wedge-Lock is completely flexible to meet changing space requirements. Send coupon for literature.

#### REPUBLIC STEEL CORPORATION Dept. C-1734 3104 East 45th Street Cleveland 27, Ohio

☐ Have a Pig Iron Metallurgist call.
Send more information on:

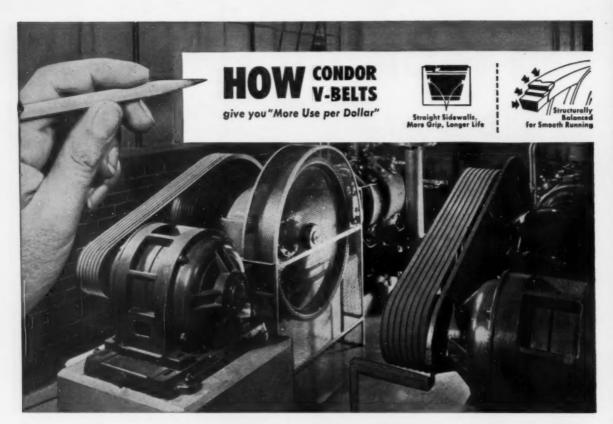
☐ Chain Slings ☐ Materials Handling Equipment ☐ Wedge-Lock Steel Shelving

Name\_\_\_\_\_Title\_\_\_

Company

Address

City\_\_\_\_\_State\_\_\_\_



## These Smoother Running V-Belts Lower Your Operating Costs

Condor V-Belt engineering makes the difference. The strength member is micro-positioned in heat dissipating rubber for a smoother running, cooler running drive... for longer life with the heaviest power loads. Condor V-Belt sidewalls are made straight to put positive pressure on the sheave grooves for more grip... less slip. Straight sidewalls help support the superstrength synthetic cords of the belt in a straight line so that all cords pull equally... deliver their maximum share of power. Controlled length is accomplished through prestretching during manufacture to remove inelastic stretch that might otherwise occur on the job.

#### NOW...Moisture-Proof Vacuum Packaging

R/M's exclusive new vacuum sealed moisture-proof packaging assures positive V-belt length control for users of longer lengths in C, D & E cross sections! Belts are measured at the factory under controlled humidity and identified for precise matching. They are then vacuum-sealed in moisture-proof aluminum lined bags. The result—no shrinkage or elongation in storage...sustained uniformity on the drive! Length is certified from the factory to the field.

#### R/M Poly-V\* Drive

A New Belt Drive Concept For Heavy-Duty Power Transmission. Eliminates Y-belt matching problems. Delivers up to 50% more power in the same space as regular Y-belts or equal power in less space.

Write for copy of Poly-V Drive Bulletin #6638.

("Poly-V is a registered Raybestos-Manhattan trademark)



RM-606



MANHATTAN RUBBER DIVISION-PASSAIC, NEW JERSEY

#### RAYBESTOS-MANHATTAN, INC.















Flat Be

Conveyor Belt

Roll Coverin

Tank Lining

Abrasive Wheels

Other R/M products include: Industrial Rubber \* Fan Belts \* Radiator Hose \* Brake Linings \* Brake Blacks \* Clutch Facings Asbestos Textiles \* Packings \* Engineered Plastic, and Sintered Metal Products \* Laundry, Pads and Covers \* Bowling Balls



Published in the interest of the Soft Drink Canners Association and the can-ning industry.

No headaches in these drinks!

Eliminate the hazard of broken bottles in your plant by providing your employees the safety and convenience of canned soft drinks.

Call your soft drink supplier and learn the many advantages of dispensing drinks the modern way-in cans.



Above are illustrated two of the modern cans for soft drinks, now available for in-plant use.

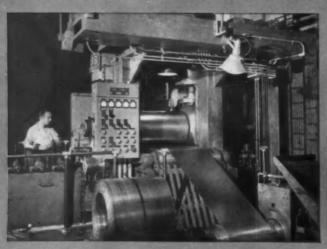


#### THE YOUNGSTOWN SHEET AND TUBE COMPANY Carbon, Alloy and Yoloy Steel

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS





New Bliss 4-stand tandem mill at Empire Steel. Each stand is a 19" and 51" by 52" four-high mill. All entry and delivery equipment, including tension reel, coil buggy and belt wrapper were also made and installed by Bliss. Many of the rolls were supplied by Bliss' Mackintosh-Hemphill Division.

New Bliss 2-high 30" x 50" temper mill processes much of the output from the tandem. Its rated speed and coil capacity are the same as the big mill's.



# Why Empire Steel picked BLISS mills for its new cold roll department...

Already known as a producer of hot rolled sheet and plate, Empire Steel Company, Mansfield, Ohio, has just completed a new cold roll department that ranks as one of the most up-tothe-minute in the country.

The key installation is a new Bliss four-stand tandem mill. Its 1866-feet-per-minute delivery speed on wide strip provides ample capacity for all Empire's foreseeable needs. A new Bliss single-stand two-high temper mill completes Empire's cold rolling facilities. Both mills are equipped with Bliss entry and delivery equipment capable of handling coils weighing up to 34,000 pounds.

Empire's selection of Bliss equipment was a logical one. Four years ago, Bliss engineered a complete hot strip mill for Empire, including the rebuilding of some existing equipment and the addition of completely new mills and accessories. The success of this modernization program had a strong influence on the company's decision to come to Bliss for its new cold rolling department.

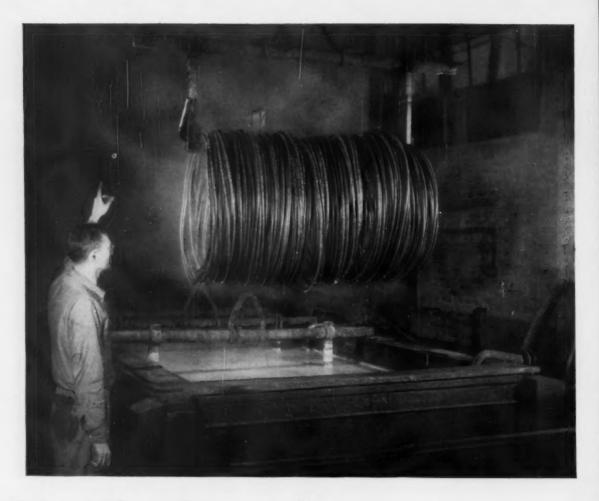
Whether you need a complete new mill or advice about modification to your existing facilities, it will pay you to discuss your problem with a Bliss engineer. To get acquainted, why not write for a free copy of our 60-page Rolling Mill Brochure, Bulletin 40-A.

BLISS

is more than a name . . . it's a guarantee

E. W. BLISS Company, General Office: Canton, Ohio ROLLING MILL DIVISION: SALEM, OHIO

Plants at Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Midland and Pittsburgh, Pennsylvania; San Jose, California. Representatives throughout the United States.



## Tight pickle tanks year after year because Monel tie-rods keep their threads

This tank is four years old ... and its tie-rods are in perfect condition. The Superior Drawn Steel Company, Monaca, Pa., wants it that way so that they can tighten up on rods; keep timbers tight; and cut acid leakage.

They find the best way to keep tight tanks is to use tie-rods that keep their threads. And the rods they use are of Monel\* nickel-copper alloy. Monel alloy resists corrosion, can't dezincify, remains strong and tough through many years of service. And threads behind the nut stay sound, too.

Superior Drawn Steel Company takes full advantage of these Monel qualities. They use Monel nails in tank construction. They use it as hooks. As chains . . . for loading and unloading.

Why is this alloy put to so many pickling uses? Not only because of corrosion resistance, strength and toughness, but because it is easy to fabricate into efficient work-handling equipment.

Interested? Then write for our new booklet, "Equipping the Pickle House for Greater Production at Lower Cost."

\*Registered Trademar

The International Nickel Company, Inc. 67 Wall Street New York 5, N. Y.



Now it's a lime tank . . . eleven years ago this was a pickling tank with the same Monel tie-rods that now hold it tight. Service like this has led Superior Drawn Steel Co., Monaca, Pa., to standardize on Monel tierods for all tanks in their wire pickling line.





pickling equipment

steel turnings can be mighty troublesome

# until they're reduced to this size



Feeding steel turnings to the Jeffrey crusher as they come from the machines.



From the crusher, the reduced metal now goes to the centrifugal oil separator.



Jeffrey bucket elevator carries scrap to storage for delivery to trucks.

You haul only one-third the volume of scrap, and it's much easier to handle after you put your metal turnings through a Jeffrey crusher. Scrap brings a better price and it is practical to spin the turnings to salvage the cutting oil that clings to it.

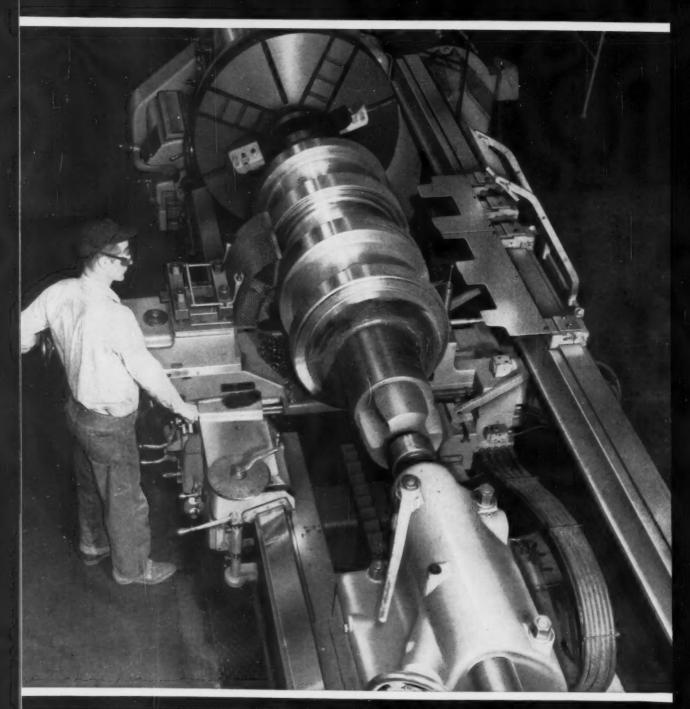
You save on labor, get more money for your scrap, and reclaim valuable coolants. Thus you greatly increase the earning capacity of your salvage department.

Whether your problem is crushing turnings, pulverizing coal, shredding wood or grinding some other substance, there's Jeffrey know-how and equipment to help you. Bulletin 837-A describes it. The Jeffrey Manufacturing Company, Columbus 16, Ohio.



CONVEYING • PROCESSING • MINING EQUIPMENT • TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

# LeBlond Lathe eases cost squeeze ...on rolls that



A set of Shape rolls of 30% dia. x 51° body cast alloy semisteel are turned to .005° tolerance in 94 hours on this 50° LeBlond Roll Contouring Lathe. Set-up time—¼ hour. Clamped-on and brazed-on carbide tips are used at 48 rpm, .040 ipr feed. Conventional roll lathe took 245 hours for the same set of rolls.

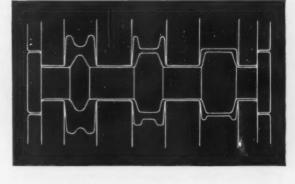
## squeeze channels from blooms

U. S. Steel Lops 151 Hours Off 245-Hour Roll-Turning Job.

Every day at U. S. Steel's Clairton Works, Clairton, Pa., miles of "hotter-than-orange" steel are squeezed through the passes of rolls like these for reduction, elongation, shaping. They come out as finished structural steel for the "jungle-gym" frameworks of modern buildings. Turning these costly shape rolls with their steep-angle contours used to keep a lathe running 245 hours on a set of roughing rolls at U. S. Steel. Tool life was short and the job required highly skilled operators. Stepped-up schedules called for a new solution to this tough-nut production problem.

A LeBlond 50" Roll Contouring Lathe, as recommended by Pittsburgh Distributor, Barney Machinery Co., immediately slashed the 245-hour turning time by an astonishing 61.7%. Now U. S. Steel saves 151 hours on one set of roughing rolls—more than enough time to turn out two more just like it. Tool life is greatly improved and less experienced operators can handle the work.

The 50" LeBlond Roll Contouring Lathe is equipped with two-directional hydraulic tracing. A single valve automatically controls two hydraulic motors for cross and length feed. A stylus follows a flat template mounted at the back of the lathe. Feed and speed can be varied during a cut without leaving a tool mark. For roughing,



Typical roughing rolls for 8" channel

hydraulic cross feed can be by-passed and length feed used separately. This enables operator to cross feed manually, use template as length stop. Mechanical power rapid traverse to carriage and cross slide is also provided. All controls are located conveniently at the apron. The lathe uses a 40 constant horsepower DC motor, has nine speed changes in the headstock, delivers infinitely variable speeds from 1 to 165 rpm.

Whether your turning jobs involve specialized production like roll-turning, or call for high precision, high production—investigate LeBlond's complete line of 76 lathe models. LeBlond engineers will help you get a better turning job, faster. Write today or see your nearby LeBlond Distributor.

Ask for complete information on Roll Contouring Lathes in 25", 32", 40" and 50" sizes.

Turned faster by



THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES . FOR MORE THAN 66 YEARS

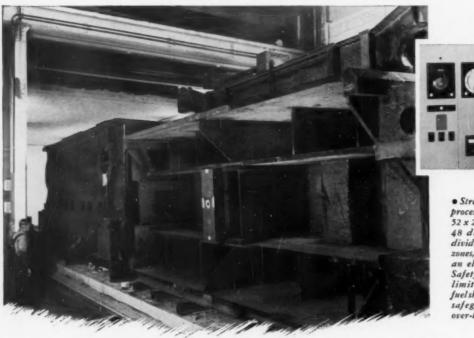
# How Morgan stress relieving insures maximum design strength

• STRESS RELIEVING is one of many reasons why Morgan cranes provide longer, completely safe service under any operating conditions. Trolley frames, end carriages, trucks, drums, bearing caps, stripper barrels and rams, pit rams... all are stress relieved in Morgan's huge furnace capable of handling loads up to 250,000 pounds.

Morgan's stress relief furnace, one of the largest in the world, can raise temperatures 200 degrees Fahrenheit per hour up to 1750° F.

Stress relieving is still <u>another</u> example of the advanced design and construction features that make Morgan cranes the best in the business.

Performance records prove that Morgan cranes cost less to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!





• Stresses built up in welding process are relieved in this 52 x 20 x 15 foot furnace. The 48 dual fuel burners are divided into three temperature zones, each zone controlled by an electronic potentiometer. Safety devices include high limit temperature controls, fuel shut-off valves. Combustion safeguards insure against over-beating.

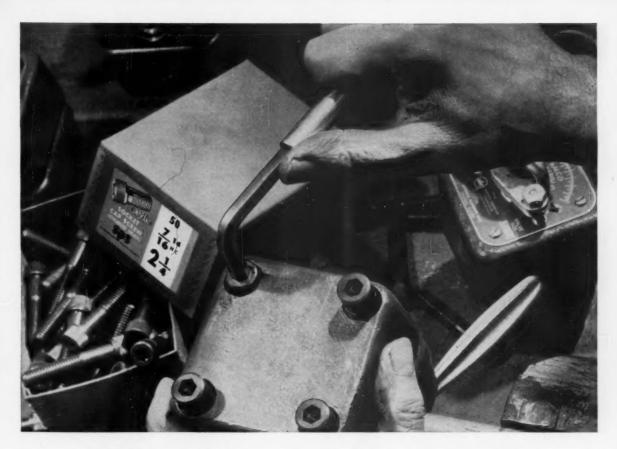


The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

MORGAN

ENGINEERING CO. Olliance, Ohio

THE IRON AGE



## Tighten socket screws tighter, more safely with High-Titan UNBRAKO hex keys



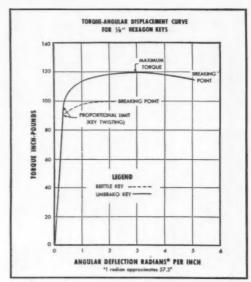
High-Titan UNBRAKO socket screw keys are stronger than ordinary keys. They are made of selected, accurately sized hex stock, with carefully formed 90° bends that won't break. The ends are cut square to engage sockets full depth for highest tightening power. These keys are heat treated uniformly to give hardness and ductility clear through without brittleness or decarburization.

All this results in many advantages. You can torque up a screw tighter with an UNBRAKO than any other

key. Performance is consistent-you can apply the same tightening torque every time. Screw sockets won't ream, and the keys won't wear excessively. If you should apply too much torque, a High-Titan would break, but shear off clean and even with the top of the socket-not at the bend-and without leaving jagged exposed edges to gash your hands.

One High-Titan hex key is included with each standard package of Unbrako socket screws. High-Titans are also available as sets in convenient, durable plastic key folds, and in bulk. Your authorized industrial distributor carries them in stock. See him today. Unbrako Socket Screw Division, STANDARD PRESSED STEEL Co., Jenkintown 17, Pa.





THESE CURVES SHOW THE DIFFERENCE between an UNBRAKO hex key and an ordinary key. The Unbrako withstands more tightening torque, twists through 180° without breaking, then shears off even with the top of the screw socket. Ordinary keys snap off suddenly at the bend.

May 10, 1956

# ULBRICH Stainless Steels

COMPLETELY EQUIPPED CONVERTING WAREHOUSE

STRIP • Flat Wire and other Stainless Steels

Converted to your closest requirements and

exactly as you want it!

Inquiries for small lots welcomed.

THIN GAUGE

TUBE POLISHING

ROLLING

INVENTORY

EDGE ROLLING

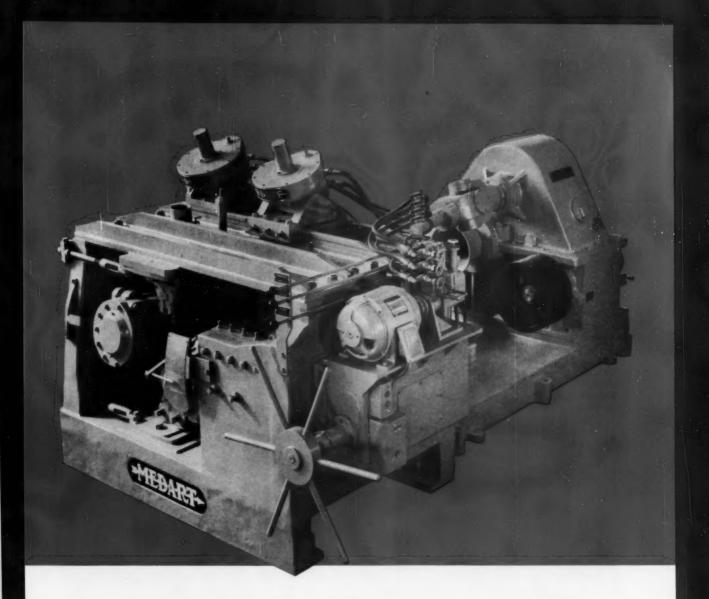
FLATTENING & SHEARING

**ULBRICH Stainless Steels** 

WALLINGFORD, CONN.

Phone: COlony 9-7771

SLITTING



#### **BLAW-KNOX MEDART** makes what it takes

#### for continuous, high speed straightening, sizing and polishing

You can meet the most rigid requirements for cold finishing round bars, pipes and tubes with a Blaw-Knox Medart 2-roll Rotary Straightener. Designed to perform with the greatest accuracy, it straightens, "super-finishes," and corrects out-of-roundness in one operation.

Processing begins the instant the workpiece enters the rolls and continues right up to the very end. Because of this you can straighten short lengths as well as longer standard mill lengths. A modified straight roll then deflects the workpiece into the concave roll giving it a tremendous number of straightening cycles per foot, assuring precision straightening and sizing.

And this highly accurate finishing can be delivered at throughput speeds up to 350 ft/min. Operation is continuous by means of end-to-end feeding. The drive motor can be reversed with the bar between rolls to permit additional passes for sizing and polishing.

The speed, versatility, and accuracy of Blaw-Knox Medart 2-roll Rotary's have made them the standard of the industry. Available in ten sizes, they can handle workpieces from ½" to 9" diameter. Contact us for detailed information, technical assistance or service.



#### BLAW-KNOX COMPANY

Foundry and Mill Machinery Division

Blaw-Knox Building • 300 Sixth Avenue Pittsburgh 22, Pennsylvania





# Custom-Engineered Upright Cone Wire Drawing Machines



★ With Drive, String-Up and Packaging Equipment To Fit Your Specific Requirements

★ And Precision, Quality Construction Throughout

Here are four examples of Waterbury Farrel's long-proven ability to customengineer wire drawing machines for specific applications. The machine you need may call for another variation in design. For further information on the size and type of upright cone machine fitted to your exact requirements, contact Waterbury Farrel, today.



No. 1 Machine with a reversing type block attachment.





No. 4 Machine aguipped with a cradle type floor speeler.

Size of Machine	No. 1	No. 2	No. 3	No. 4
Max. No. of Dies	16	14	12	13
Max. Starting Size B & S	#14	#8	#4	1/4
Finishing Sizes, 8 & S	#26 to #42	#20 to #34	#14 to #26	#12 to #18

SPECIFICATIONS

WF-26

WATERBURY FARREL
FOUNDRY & MACHINE CO.
Waterbury, Conn. U.S.A.

Sales Offices: Chicago . Cleveland . Millburn, N. J.









What they have accomplished shows up in lower assembly costs in your shop—via super-accurate forming to close tolerances, scrupulously clean threads with perfect concentricity and uniform lead, flawless washer faces, sharp cornered heads that won't slip in your tools, points flat and normal to the screw's axis... all of which mean extra fastenability.

Higher tensile too—these cold forged double-extruded cap screws made by Cleveland's own Kaufman Process now give you extra margins of strength.

No extra charge for any of these fasteners that help you put together a better product. Ship-at-once stocks of every kind and size we make! Ask your jobber for Cleveland Fasteners—or write us for latest stock list.

#### WAREHOUSES:

PROVIDENCE - LOS ANGELES

Originators of the Kaufman DOUBLE EXTRUSION Process

#### The Cleveland Cap Screw Company

2929 East 79th Street, Cleveland 4, Ohio • VUlcan 3-3700 • TWX CV 42

At Design Engineering Show, Booth 324 . NAPA Inform-A-Show, Booth 237



## You get **Convenience** and **Quality** with Johnson Bronze Bars

For your convenience, Johnson Bronze solid and cored bars are now stamped on each end with the exact size. This makes it unnecessary to remove bars from bins to check the OD for size—helps prevent errors—makes for quick inventory. Also, bars of various sizes can be stored in one bin because the size is visible which saves storage space.

In addition, the ends of all Johnson bars are centered for ease and accuracy of machining. All the operator has to do is set the chuck on the indented marks, take a ½4" cut and he has the size bar indicated. This speeds machining, assures concentric parts since the work is always in perfect alignment. Also, Johnson bars are in the convenient 13" length—are easy to store and handle.

The quality of Johnson bronze bars is rigidly controlled from heat to heat by frequent chemical analysis. These bars are produced in permanent molds or by centrifugal casting. Either method eliminates the possibility of sand inclusions—allowing maximum uniform density.

Johnson Bronze bars are available in over 400 stock sizes. They are used extensively for making bearings, washers, thrust plates, gears, pinions, guides, rollers, sheaves, trolley wheels and other parts for original equipment and maintenance. They are quickly available from your distributor. Ask him for a folder which lists the range of sizes of cored and solid bars or write Johnson Bronze Company, 505 S. Mill Street, New Castle, Pa.

## **Johnson Bearings**



GRAPHITED over 175 sizes



GENERAL PURPOSE over 900 sizes



INIVERSAL BRONZE BARS



LEDALOYL over 400 sizes



ELECTRIC MOTOR over 350 sizes

# Broach Your Helical Transmission Gears

# gour Costs

This is a 73 tooth automatic transmission gear—5.5853 P.D., 14 pitch, 20° pressure angle.

It is broached in just one pass. A single shaving operation completes it.

All critical dimensions including lead and concentricity are held to extremely close tolerances.

Broaching time	25 Seconds,
Shaving	40 Seconds,
Total machinin	65 Seconds

The 7 foot Naloy Broach used also chamfers the gear tooth edges as it cuts the teeth.

The constant and intimate contact Red Ring engineers have with advanced gear practice gives them a very real advantage in the design and production of gear tooth broaches.

Write for specific suggestions on your broaching operations.







NATIONAL BROACH AND MACHINE CO.

5600 ST. JEAN ...... DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

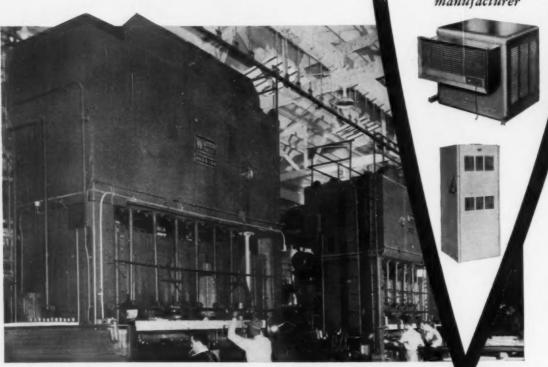
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# Warrio

GIVES YOU A LOT FOR YOUR MONEY



Says leading west coast appliance manufacturer



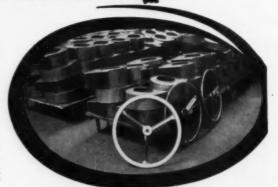
"Rugged, dependable, versatile, well designed," says tool and die head of these Warco Presses.

"I recommended Warco Presses because they are rugged, dependable, versatile and well designed pieces of equipment." This is a statment from John H. Abbott, head of the tool and die department of Utility Appliance Corporation, Los Angeles, one of the west coast's leading appliance manufacturers.

Included in the several Warco Presses now being operated at Utility are two 400-ton and two 250-ton Eccentric Gear Presses that have convinced Utility officials that "Warco Quality" is more than just an advertising phrase.

When next you're considering press equipment, why not let us put you in touch with a Warco user in your area. We

believe your first Warco will convert you, too, to "Warco Quality Presses."



Samples of press production at Utility include these centrifugal blower parts.



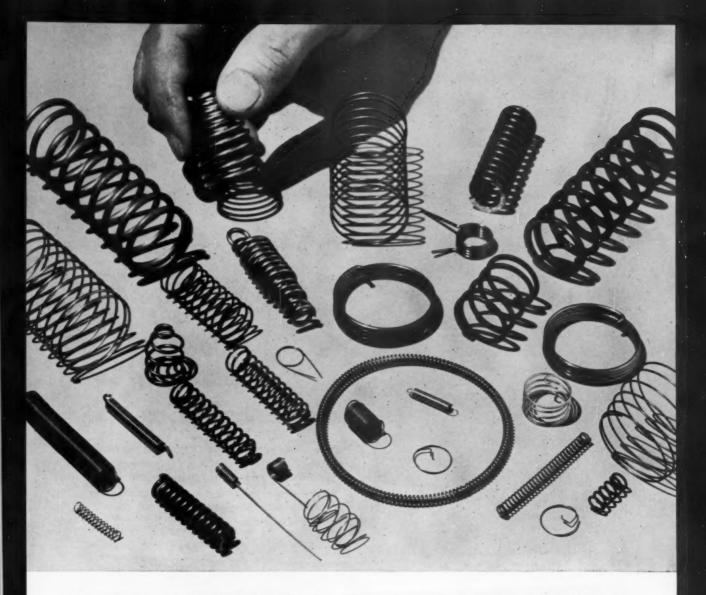
Federal

The Federal Machine and Welder Company

WARREN, OHIO

9937

THE IRON AGE



#### How the right "COAT" solves many spring problems

• Unless you yourself go in for forming wire springs, you have no idea what a tricky business it is. For one thing, as every fabricator knows, it takes extreme uniformity in the wire to obtain the precise dimensions and the exacting tension, torsion or compression characteristics so often required.

But uniformity alone won't always do the trick! As a leading supplier of special wire for tougher-than-usual spring requirements, National-Standard has delved deep into production problems and has come up with answers that help many a fabricator hold better to tough specifications and produce faster with less waste and more profit!

Time and again, for example, National-Standard has shown that merely a change in wire coating or lubrication quality is of major importance in forming operations. Proper coating also helps gain uniform dimensional response to heat treating. Quite often, in fact, troubles chalked up to wire variance are really the fault of improper coating or finish.

Helping fabricators solve problems and cut costs is a National-Standard specialty. We're geared for it and make a point of it. Try us and see!

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

ATHENIA STEEL DIVISION • CLIFTON, N. J. Flat, High Carbon, Cold Rolled Spring Steel

REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
Industrial Wire Cloth



WAGNER LITHO MACHINERY • JERSEY CITY, N. J. Special Machinery for Metal Decorating

WORCESTER WIRE WORKS DIVISION - WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

#### For Special Operations in Steel Mills...



STAMCO Coil Box, coil opener and feeding unit



for the equipment you need

For mill or warehouse use on ferrous or non-ferrous material. STAMCO has a model or size to fit your needsor can make it for you. If you use trimming units, plate shears, slitting units, coil openers or any other special steel mill equipment, it will pay you to write us. No obligation.





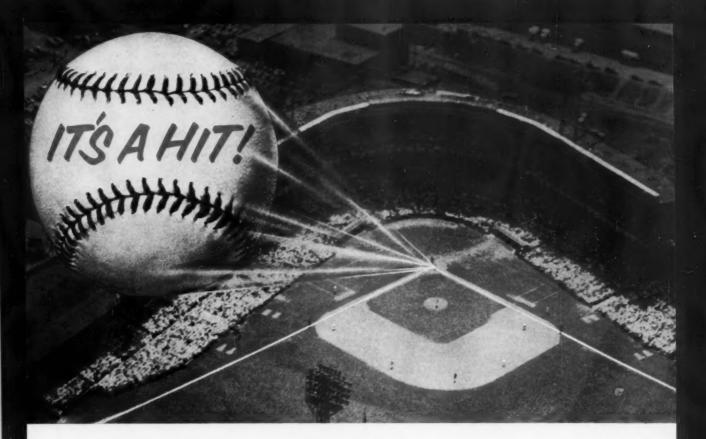
STAMCO 48" Slitting & Coiling Line 15000# coil capacity STAMCO 72" Heavy Gauge Side Trim-



ming and Slitting Unit equipped with a double set of feed and delivery



O PROBLEMS



## How to IMPROVE your production BATTING AVERAGE

You'll lead the league when you switch to Cimcool, the radically new and different cutting fluid. Here are three ways that Cimcool Standard Concentrate can improve your production batting average:

- CIMCOOL LOWERS COST because it's longer lasting in machines. Thus, it reduces downtime and cuts labor costs for cleaning and changing.
- CIMCOOL IMPROVES TOOL LIFE because of its chemical lubricity. It permits faster speeds and feeds, for it combines friction reduction and cooling capacity in a degree never before attained by old-fashioned coolants.
- CIMCOOL IS CLEAN, doesn't soil clothing or hands. It contains
  no skin irritants. It leaves no slippery film on shoes, floors,
  machine or work. It can't smoke, can't burn, and virtually
  eliminates rancidity and foul odors.

For full details on CIMCOOL Standard Concentrate—and on the entire family of CIMCOOL Cutting Fluids—just contact us. Wire, write or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

\*Trade Mark Reg. U.S. Pat. Off.

#### CIMCOOL CUTTING FLUIDS

- CIMCOOL Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.
- CIMCOOL Tapping Compound—Permits the use of highest tapping speeds and increases tap life amazingly.
- CIMPLUS The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.
- CIMCUT

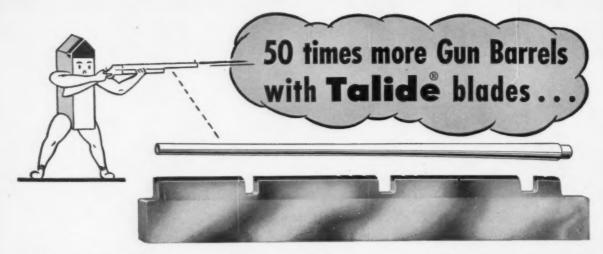
  Base Additive For jobs requiring an oil-base cutting fluid. Added to mineral oils, it gives an economical mix for higher speeds and feeds.
- CIMCOOL Bactericide The most effective agent yet developed to overcome rancidity and foul odors.
- cimcool Machine Cleaner The two-phase non-corrosive cleaner that removes grit, dirt, slime and oil.

\*

CIMCOOL
Cutting Fluids

for 100% of all metal cutting jobs

PRODUCTION PROVED PRODUCTS OF THE CINCINNATI MILLING MACHINE CO



Leading Arms Producer reports outstanding service life with Talide centerless blades over past 10 years—outperforming and outlasting all other work support blades.

Part...... 12 gauge shotgun barrel.

Operation.....Grind entire gun barrel simultaneously to series of compound angles.

Machine ..... No. 5 Cincinnati Centerless Grinder.

Blade ....... Special Talide-tipped work support blade 34%" long, having 9 steps and 10 compound angles ground to .0001" tolerance.

Tolerance..... Talide blades, due to their negligible wear over long periods of service, enabled the above Arms Producer to maintain the extremely close tolerances required on the above part—and at less cost than possible with any other tooling.



One-piece Talide strip (up to 100" without seams) prevents scoring and scratching. Write for new 84-page Catalog 56-G or ask for sales engineer to call. . . . Metal Carbides Corporation, Youngstown 12, Ohio.

#### 1,000,000 CUTS WITH TALIDE SHEAR BLADES!

A large mid-west electrical equipment manufacturer reports exceptional service life with Talide-tipped shear blades 39" long cutting silicon steel for transformers. Over 1,000,000 cuts are being obtained per blade, compared to 8,000 cuts with a hi-carbon, hi-chrome blade. Burr-free, clean-cut edges produced with scrap rate practically eliminated.



#### STANDARD OR SPECIAL CENTERLESS BLADES!



Standard Talide-tipped blades are available from stock in over 50 styles and sizes for both Cincinnati and Landis Centerless Grinders and for either infeed or thru-feed work. Special blades to handle parts having steps, tapers or profiles can be made promptly to special order, Blades can be supplied in lengths up to 100" and ground to any tolerance or shape.

#### 4,600 MILES OF SCOTCH TAPE CUT!

A leading producer of scotch tape installed a set of Talide rotary slitter knives 5 years ago on a line cutting scotch tape to size. The original set of knives have, to date, cut 7,000,000 yards of scotch tape with no signs of wear—no resharpening—and no downtime experienced. Officials have decided to equip over 100 shearing machines with Talide knives as a result of the above phenomenal performance.





HOT PRESSED AND SINTERED CARBIDES . VACUUM METALS HEAVY METAL . CERMETS . HIGH TEMPERATURE ALLOYS OVER 25 YEARS EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

# NOW AVAILABLE! Farpenter PVC pipe and fittings

for cost-saving corrosion control

• Here is a new Carpenter service to help processing plants cut piping costs for handling a wide variety of corrosives under moderate operating temperature and pressure conditions. Carpenter PVC Plastic Pipe and Fittings are admirably suited for such piping requirements because of the excellent corrosion resistance, strength and other desirable properties of the unplasticized polyvinyl chloride from which they are made. They withstand both oxidizing and reducing conditions. For this reason, Carpenter PVC Pipe and Fittings supplement other corrosion-resistant piping materials previously made available by Carpenter research and production advances in stainless and specialty steels.

Two types of Carpenter PVC Pipe and Fittings are available—No. 1 provides outstanding chemical resistance along with high strength, toughness and rigidity. No. 2 provides high impact strength and excellent corrosion resistance. Both types are available in eight pipe sizes of ½" to 4". Pipe is made in Schedules 40 and 80. A full line of Schedule 80 threaded and socket fittings is available.

Easily and economically installed with usual piping tools, Carpenter PVC Pipe and Fittings assure trouble-free service with cost economy. Why not look into the advantages of using Carpenter PVC piping systems in your plant? Consult your nearby Carpenter Distributor or Representative and ask for new Technical Bulletin T.D. 119.

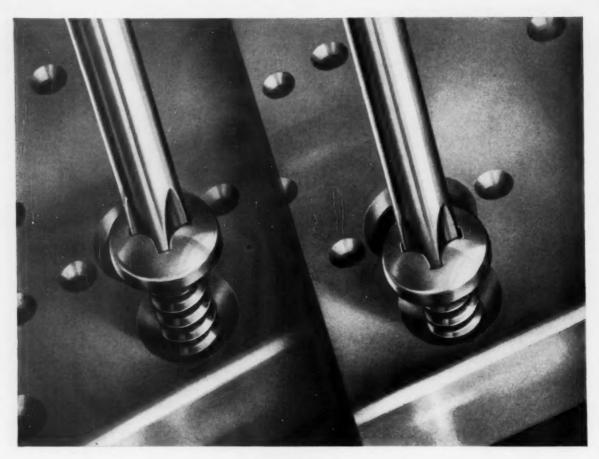
MEMBER



The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y .- "CARSTEELCO"





They may APPEAR the same, but... nerican is the name!

Examine your fastening costs and you will find four factors:

1. price

2. service

3. quality

4. research

Now and then you may find a temporary price differential you feel may be worth anything to you. But no one gives you more of all four than American.

#### AMERICAN GIVES YOU MORE OF ALL FOUR

. . . in service, where American is noted for keying deliveries to the most precise production schedules. Like a storm door and window manufacturer who uses more than 15 million American Phillips fasteners a year.

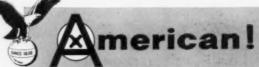
. . . in quality, backed by controls that produce standard units with tools made to tolerances closer than generally used by other manufacturers.

. in research, where American not only developed the Phillips Head fastener, but helped one manufacturer switch from an expensive, milled-from-the-bar refrigerator bolt to a simple, inexpensive cold-headed unit.

If this sounds like it could be worth money to you to explore, you're right. And nowhere will you find more of the four basic features you want than

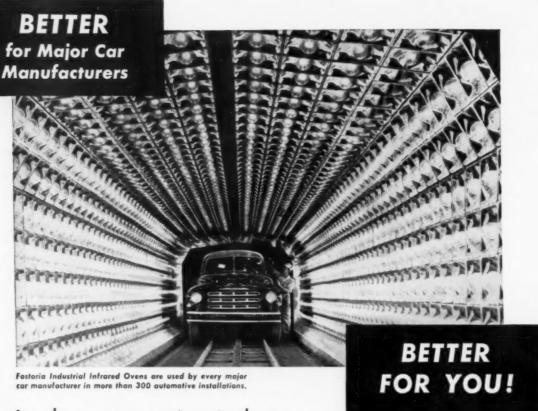
from American - price, service, quality and research.

your inquiry for price and delivery or your specifications for special fasteners. Write:



AMERICAN SCREW CO. . WILLIMANTIC. CONN. NORRISTOWN, PA. . CHICAGO, ILL. . DETROIT, MICHIGAN





# In the automotive industry MILES OF OVENS ... BY FOSTORIA give top-quality results ... at lowest cost!

Don't take our word for it—look what's been happening in the highly competitive automotive industry. Today, the customer list for Fostoria Radiant Ovens reads like a "Who's Who" among automotive manufacturers. The list of Fostoria users includes all of the major car and truck manufacturers in this country. It also includes many automotive component part manufacturers and assembly plants overseas. These companies are ordering and reordering Fostoria Ovens...and have been for years! The reason behind Fostoria's position

of leadership is clear. Fostoria is the world's oldest and largest manufacturer of industrial infrared ovens—with unrivalled application "know-how" and experience in engineering all three major types of industrial infrared equipment, from components to complete ovens—Quartz Lamp, Radiant Rod and Conventional Infrared Lamp. An experienced Fostoria sales engineer is ready to help you achieve important savings with Fostoria Radiant Ovens too.

Call him today and take advantage of these specialized services. There's no obligation.

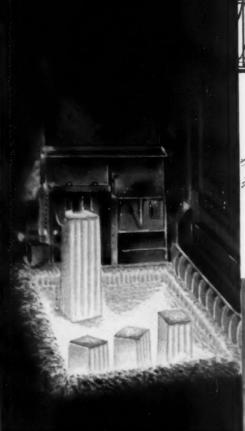


Write for a free copy of "Applications Unlimited," a fact-filled booklet of cost-saving information on Radiant heating.



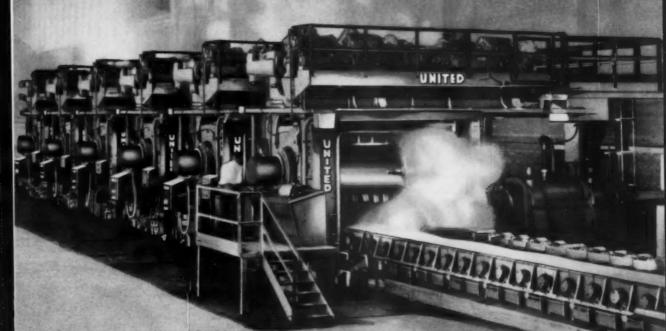
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THE FOSTORIA PRESSED STEEL CORPORATION, Dept. 524, Fostoria, Ohio





6-STAND 4-HIGH HOT STRIP MILL



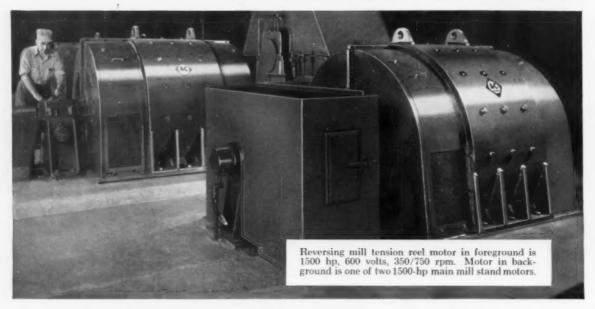
ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Designers and Builders of Perrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Modular Iron and Steel Castings and Waldments.

ALLIS-CHALMERS MOTORS

# Furnishing All Drive Power for New Steel Facilities



# Dependable Allis-Chalmers Motors Play Key Role in Steel Mill Expansion

Expansion recently completed in an eastern steel mill included two new processing lines and a new reversing mill. Allis-Chalmers application-engineered motors furnish dependable, economical drive power for these new specialized steel facilities — helping this major producer attain top steel yield.

For experienced help with your expansion or modernization plans, contact your local Allis-Chalmers office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.



Here are Allis-Chalmers 100-hp, tube-type, TEFC explosion-proof cage motors driving pumps in oil room below the reversing mill. NOW, you get even more winding protection with SILCO-FLEX

all-silicone-rubber motor insulation, available only on Allis-Chalmers motors — in many of the larger sizes. Ask your A-C representative for the facts about this revolutionary new insulation system.

Silco-Flex is an Allis-Chalmers trademark.

**ALLIS-CHALMERS** 



#### THE IRON AGE

#### NEWSFRONT

#### Stainless Hits The Skytrails

One planemaker confidently predicts future supersonic aircraft will carry half its unloaded weight in stainless steel. This same metalworker already has rolled up considerable experience in titanium, hence is well qualified to make the comparison. Rumors persist that one fighter plane already on the drawing boards will require 70 to 75 pct stainless.

#### Hire Engineers In High School

Latest wrinkle in the wringing of hands over current engineer shortage comes from several Midwestern metalworkers. They hire science students on high school graduation, pay 75 pct of their tuition through night school engineering. Degree takes 8 years, and by then they've got 8 years of semitechnical work plus an inbred orientation in favor of their firm.

#### Synthetic Industrial Diamonds Galore

Man-made industrial diamonds soon will reach the market in large quantities. Quality equals that of current African production. Pilot plant production draws to a close shortly, with complete success rumored. Costs still remain hushhush, but presumably will rival the natural product.

#### **Unemployment Benefits Fight Rages**

Pennsylvania metalworkers worriedly continue to count their lawyers, preparing for the labor-management struggle over state-paid unemployment compensation benefits for strikers. Westinghouse unions pressured the decision from a voter-conscious state administration in their recent strike. Consensus of legal opinion indicates the decision is most likely to be reversed. Politicians add that delaying tactics are in order until after elections. Metalworkers hope they're right.

#### Low Cost Vacuum Melting

Expect vacuum melting to accelerate its boom with near-future availability of especially formulated alloys. Furnace time reportedly

will drop 25 to 50 pct using these alloys. Another cost-slasher will be low cost vacuum melting furnaces, planned for the \$6000 to \$7000 range. Most metalworking melters can use their present electrical equipment with these simplified furnaces.

#### Closer Tolerances For Metal Powders

Look around and you'll already find some firms producing sintered metal powder parts to tolerances as low as 0.0010 in. If you've eliminated metal powder as a possible material, now's the time to reconsider. Compacting pressures to 80 tons per sq in. make possible densities over six times that of water.

#### No More Undercoat In Metal Painting

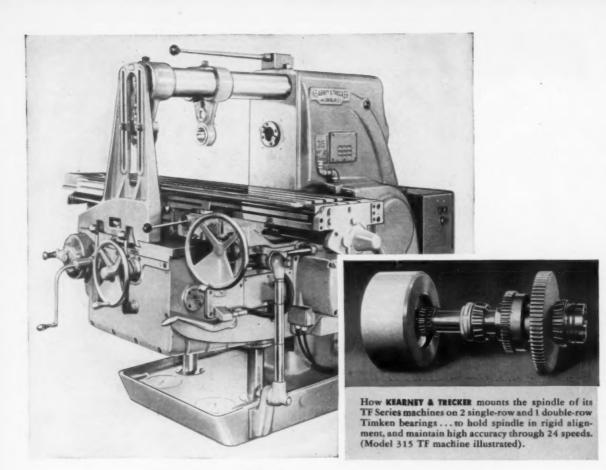
New paint (don't expect it on the market soon) apparently combines chemical treatment of metal surface with conventional pigmented organic film. Special resins comprise more than half the solids content, with reactive chemicals the remainder. Seems like the first serious attempt to merge what are now two metalworking operations into one.

#### **Plate With Pulsations**

An electroplater tinkering with some of the newer electronic tubes finds their use could cut plating time to one-quarter that now needed. By running a pulsating (also alternating) current through the plating solution, some metals build in 20 seconds to thicknesses that earlier took more than a minute to deposit. Requires a lot more research, though.

#### Freeze Your Energy, Use Later

Pass certain gases through a radar microwave field, and preserve the energy level almost indefinitely. When you need the energy, warm it up. This fantastic proposition, when further developed, may give the metalworker a satchel full of stored heat or other energy to be trotted around the shop wherever needed. Right now it's limited to gas ions.



# New milling machine gets constant accuracy through 24 speeds with spindle on TIMKEN® bearings

FROM 15 to 1500 rpm, with 24 speed changes in all, and plenty of capacity for any tool load—that's the new TF Series of twin-screw designed Kearney & Trecker mills. There are 28 Timken® bearings contributing to these machines' built-instamina and constant high precision. Most importantly, the spindle is mounted on two single-row and one double-row Timken precision bearings which hold it in rigid alignment through all speed and load changes. Chatter is eliminated, and long bearing life with minimum maintenance is assured.

Because of their tapered design,

Timken bearings take radial and thrust loads in any combination. Full line contact between rollers and races imparts extra load-carrying capacity. And of course, with Timken bearings designed to last as long as the machine itself, maintenance costs go down.

Geometrically designed to give true rolling motion, Timken bearings are precision manufactured to live up to their design—produced under rigid inspection and quality control. We even make our own fine alloy steel, something done by no other American bearing manufacturer. When you build or buy equipment, look for the "TIMKEN" trade-mark on every

bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD



#### Behind U. S. Steel's Labor Policy

Steel industry's top producer is under many pressures when it negotiates a contract . . . Unseen bargainers complicate the job . . . Personality of John Stephens keeps wheel in balance—By Tom Campbell.

♦ WHEN U. S. STEEL and the Union sit down soon to hammer out a new contract, unseen bargainers will be at the table. One who was there in past sessions will be absent—government persuasion.

But two others will be there, big as life; as if in the flesh. Management won't like it, but there is nothing it can do about it.

Who are these shadow guests who will be looking over the bargainers' shoulders? One is "Good" business. He makes David McDonold's job easier, gives the Union a strong talking point.

If business conditions were poor or if the trend were definitely downward, the Union would be less confident of its ability to force major concessions from management.

"Me, Too"

The other big ghost at all steel labor negotiations is the image of "I want better than Walter Reuther got." U. S. Steel has had to contend with this for several years—and there appears little chance of the Union giving up this ghost—at least not so long as bigger and

newer concessions spring from Detroit.

Of course Mr. McDonald, steel union head, denies that the "me too" attitude exists; or that his demands bear any relation to his feeling for Mr. Reuther, president of the United Auto Workers. The Corporation apparently feels otherwise. And those who have followed the steel and automotive negotiations for some time may be pardoned if they believe in such a ghost bargainer.

Closely akin to some of these eerie bargaining factors is the complex question "Why is U. S. Steel the target"? Why not another steel firm or firms? Especially when some steel companies fail to react to U. S. Steel settlements with any degree of affection? Or when some steel union people think privately that another company might have been easier to "make"?

Certainly U. S. Steel would welcome getting off the hot seat. It has been "it" now since 1937. Probably a book could be written about this, but the cold facts are the union wants U. S. Steel as the tar-

get and so, apparently do other steel firms.

Like all management stories, there is a strong personality in U. S. Steel's annual joust with the union. He is a front line extension of top management, the stockholders and the board of directors. Little has been written about him; yet he bears the brunt year after year of one of the cleverest and most subtle union drives in recent history.

John Stephens

This man, soft of voice—usually—and harassed by all sides—almost always—is John A. Stephens, vice president of Industrial Relations, U. S. Steel. Contrary to general opinion, this fellow who will sit down soon with his braintrust and Mr. McDonald and his braintrust is a tough man. Not always has he been the polished, courteous, calm, and patient speller-out of U. S. Steel's labor policy.

You need to know something about John Stephens to fully understand the apparently simple—but actually complex—factors in



#### **Tom Campbell**

- Tom Campbell, Iron Age editor-in-chief, has covered every aspect of steel labor since 1937 when U. S. Steel signed its first agreement with the Steel Workers Organizing Committee (SWOC). His observations have raised tempers at times, but on the whole have been borne out by the facts.
- Mr. Campbell's stories have given Iron Age readers both sides of the picture and have frequently called the turn on important negotiations. This story is an objective evaluation of U. S. Steel's labor policy on the eve of one of the most important negotiations (free from government meddling) in steel industry history.

#### SPECIAL REPORT

U. S. Steel's (hence the industry's) relations with the union. Mr. Stephens is at home with steel workers and their union representatives; probably as much as, or more than, any other person in the company.

He should be. For 15 years before joining U.S. Steel in 1934 he was knee deep in structural iron and steel, construction, and warehousing. He tried all jobs ranging from laborer to president. He started with U.S. Steel as a clerk, and he knew the depression first hand, saw what it did to people. That's why he can at times yell and pound the table with the best of them. He would rather be known. however, for what he is most of the time: a man who has the job of trying to get the best but fairest bargain possible without a slugfest.

But he can take care of himself in a slugfest if basic principles are mauled too much by the union in its efforts to not only bring home the bacon, but the eggs as well.

Attempts have been made in the past to picture Mr. Stephens as a messenger boy to U. S. Steel's top management. This was unfair because the spade work in negotiating has been left to Mr. Stephens. When the final pressure is on, of course, it is necessary for the chief executive officer of the company to spell out how far the company will go.

#### U. S. Steel Policy

Regardless of how the steel contracts work out eventually, U. S. Steel holds to what it calls basic principles. In some circles such a statement might get the horse laugh. But the facts do support the view that the company has usually considered all angles before agreeing—or before settling a strike.

Before these basic labor relations principles are spelled out let's answer this question: "Is U. S. Steel alone in arriving at the steel wage settlement?" The answer is almost a "yes and no."

John Stephens is supplied with plenty of "guidance" and "suggestions" by the industrial relations people of other steel firms. As he comes out of the sessions, he briefs these fellows on what happened. He listens to what other steel company heads have to say.

Officially there is no industrywide bargaining—except in cases where the government has stepped in with a "board." Even then there has been a "spokesman," usually Mr. Stephens. But after analyzing meetings all the way back to 1940 it is pretty safe to say there is no industrywide bargaining in the legal sense but other steel firms make known their thoughts to U. S. Steel's bargaining committee.

#### Condemn Speculation

The steel union does meet with other steel firms. Such meetings are quite sterile and are more a matter of a "watch"—or a wake; depending on the trend of the negotiations. There will be no exception to this general scheme this year. The only important exception in recent years happened during steel strike in 1949 when a major steel firm caved in while other steel companies were holding fast.

Mr. Stephens and the top nego-

tiator of another major steel firm have become incensed at speculation in the newspapers and magazines over the probable settlement. John Stephens claims these figures unduly influence the bargaining. The argument runs somewhat as follows: the "guesses" in public print as to what U. S. Steel will settle for are taken by the union as possible "true" figures. It is also argued that David McDonald watches these figures closely and then tries to better them.

Up to a certain point, Mr. Stephens and company may be right about the effect of the stories in the papers and magazines. But there is terrific competition between members of the Fourth Estate. Such stories started to appear five minutes after it became known in 1937 that Mr. Fairless was going to meet with the union for the purpose of signing a contract.

What Mr. Stephens and others may not fully realize is: people talk. always have and always will; steel people are no exception. Thus all the stories are not guesses but are often based on "out of turn" talk

#### On The Record

## U. S. STEEL on



John A. Stephens

Sept. 26, 1955

"... We believe we are realistic in United States Steel and not easily deflected from a course we consider fundamentally to

be right. Since 1945 . . . we have experienced three major strikes in defense of this belief . . . we have tried to recognize and conserve past values and to exercise some prophetic vision. Foremost among these values is the freedom and dignity of the individual and his right and obligation to increase his knowledge of conditions which affect him. We expect failures . . . we'll try again in the conviction that big objectives require time, persistence, unwillingness to be discouraged . . ."

". . . We continue to believe that the results of bargaining in another industry should control only where provisions agreed on by steel officials as to what U. S. Steel will hold still for.

But it is a fact that this public speculation (why should the steel industry be any less gossipy than any other industry or group?) does put pressure on U. S. Steel (and hence the industry) at the bargaining table.

#### Formal Bargaining

We now come to the "formal" bargaining event. It usually starts with about 75 to 125 steel people, headed by Mr. Stephens. These include: lawyers, statisticians, industrial relations experts, various steel executives, and others who have helped prepare for the meeting. This large group faces about the same number of union people.

This initial meeting is pretty much window dressing. Many speeches are made by both sides. Some of the union boys talk for home consumption; some of the steel fellows talk for inner company consumption.

Later the steel group is cut down to 10 to 20; same for labor. Arguments get loud and often unruly. This will be particularly true this



JOHN A. STEPHENS and David J. McDonald after contract signing.

month as the union strives for a healthy wage increase, unemployment benefit fringe, and premium pay for weekend work. In this medium-sized group are those who help bring some of the demands down to earth.

The next group to meet has usually been cut down to five on each side. Here is where some tall arguing is done; where threats are made. It is all in the game. This is where John Stephens makes a seri-

ous pitch for the responsibility U.S. Steel believes it has to the nation, its industry, its stockholders, and its customers.

Contrary to what some people may think, the steel corporation will take—and has taken—a strike if it believes the union is pushing it too far from its basic labor relation policies.

Now the meetings get down to business. Both sides are pledged to secrecy—and they keep it. Each takes the latest demands and counter proposals. But now towards the end of the period the "crisis" group takes over. The teams are now down to 2 or 3 on each side.

#### Tempers Flare

The air gets pretty blue as the union pushes U. S. Steel's people close to the breaking point. This is the area and time where the patience, experience, and sincerity of John Stephens come into play. If these fights get out of bounds and go beyond the closed doors, the chances of agreement are usually shot to pieces.

This year both sides will try to refrain from public dog fights or

## Labor

properly fit. Achievements elsewhere can of course constitute a standard for ultimate accomplishment if they are sound. We recognize there is competition between unions and union leaders but we do not believe that this competition should establish in the leaders' minds the beliefs that the standard by which their stature will be measured is what some other leader in a different setting secured in bargaining . . . A sound standard is conditions . . . and relations in each individual enterprise . . . "



Benjamin F. Fairless

July 25, 1952

"... I am convinced Philip Murray and his organization have no thought of wanting to take over the management of the steel industry. Likewise I am certain that the United States Steel Corp. has no thought to destroy the Steelworkers union ... We have the workers represented by you with facilities not worth a tinker's dam unless properly manned.

#### U. S. Steel

Annual Report 1955-P. 27

"... The first one (basic roots of inflationary tendency) is the institution of industry-wide labor unions, headed by leaders who, with power to bring about industry-wide strikes, seek always to out-do each other in elevating employment costs in their respective industries ..."



#### SPECIAL REPORT

telegraphic or public - statement brawls. These things may make good news copy but they endanger seriously the chances of escaping a strike. When the eleventh hour comes, both sides are usually sure of where they stand. Misjudgment means a strike. Neither side wants strikes but both know when they have been pushed "too far." This year the Steel Corporation will not stand to be "taken" for what it considers to be demands in excess of any reasonable logic. Yet the Corporation knows what happens in a strike; it has faced-with other firms - three major strikes since

#### The Critics

Critics of U. S. Steel have often accused the Company of abdicating its position of leadership in wage matters. They have said, too (usually anonymously), that Steel took the easiest way out and passed the freight on to its customers. If the Corporation acted in a vacuum, some of this criticism might be valid; but it takes its responsibilities seriously.

The Corporation wants no strike because it knows all lose; yet it will take a strike on basic principles—and has. It will do it again in similar circumstances.

These cases are cited to show the Corporation has not been a pushover. Yet it is clear it does not believe in union busting—and there is no chance that U. S. Steel policies would countenance such a move. Mr. Stephens' relations with the union and Benjamin F. Fairless' promise say loudly and clearly that the companies know the unions are here to stay. The company hopes the growth in maturity will finally

Steel industry officials hope for an end to steep and frequent wage cost increases that force higher prices—which in turn force higher prices for capital and consumer goods.

eliminate "muscle" negotiations.

Judged from what has gone before, U. S. Steel's labor relations are realistic and are far from being committed to peace at any price. Yet the old belligerency of the 20's and 30's is gone for good.

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#### Up-To-Date:

Mr. Blough repeats wage inflation charge

Roger M. Blough, chairman of U. S. Steel Corp., took another crack at steel labor for contributing to the wage-price inflationary spiral since World War II.

In his remarks to stockholders at the corporation's annual meeting in Hoboken, N. J., Mr. Blough, as he did in the company's annual report, laid at the feet of labor some of the responsibility for inflation. His annual report remarks drew a blast from David J. McDonald, president of the steel union.

**Annual Round** 

"... But when we talk of inflation," said Mr. Blough to his stockholders, "there are other conflicting responsibilities to be reckoned with also. For while our labor friends who are here today may differ, many informed people in this country believe that continually larger annual rounds of wage increases have become a major cause of inflation."

The U.S. Steel chairman said that labor accounts for 75 to 85 pct of the non-tax cost of the average product, from raw material to finished product.

#### Try To Avoid Strike

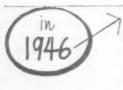
Mr. Blough said that while U. S. Steel recognizes its responsibility to keep wage increases "within bounds," it also accepts its responsibility to meet the needs of its employees.

"And to the nation as a whole we have a further responsibility to avoid, if possible, a strike that would choke off the supply of steel and bring serious financial hardships to workers and owners in hundreds of plants that depend on that supply of steel."

Mr. Blough added that "many thoughtful people—in government and elsewhere—are already gravely concerned by the seemingly-endless wage-price spiral since the beginning of World War II. These people feel, and I share their feeling, that we cannot go on forever paying more and more each year for the same article.

## When the chips were down:

U. S. Steel works hard for labor peace, but it will take a strike in defense of basic principles. For instance:



When prices and wages were under government control, the company held fast for price relief to offset an 18½¢ wage boost granted by the government. After the settlement, producers got permission to boost prices.



The company took a strike because it believed the union violated its contract by injecting pensions into negotiations a year before they were scheduled to come up.



A strike resulted over union demand for the union shop. Union won only a partial victory despite seizure of steel industry by President Truman. Seizure was overruled by U. S. Supreme Court.

#### **COLOR CODING: New Ryerson System**

Warehouse chain takes plunge with new system of marking plate and bars . . . May be big help in complex specifications . . . System is aimed at customer to help him identify his inventory—By K. W. Bennett.

◆ JOSEPH T. RYERSON & SONS took the plunge last week, and announced mid-May inauguration of the system for color marking of steel bars and plate that the company has been developing quietly over a period of years. To bar users, struggling with government marking specs that grow increasingly complex, the Ryerson announcement may seem like a voice in the wilderness.

Color marking of bar stocks is not new. Many mills and many warehouses have some kind of two color system, which, when tied in with the heat number with which most rounds over 2 in. are stamped, gives a fairly clear picture as to where a piece of steel originated and what it can be expected to do. The Ryerson system will allow the purchaser a tricolor system (markings may be as simple as a single color but can go to three colors), to determine the carbon range of the bar in question; the family series; and the finish or surface condition.

#### Like A Rainbow

A carbon steel bar, for example, will be marked with a single color identifying the bar as carbon or a carbon manganese steel. Carbon content will be indicated by either green, blue, yellow, or pink. If heat treated, the color denoting carbon content on the bar end will be a centered dot. Centered dots of colors other than carbon indicators would indicate characteristics other than analysis, carbon range, or the heat treated condition. Red always indicates an especially ground finish. Purple, black, white, gold, and brown, designate related groups of steels.

Free machining stock will be indicated by the color purple, and the same color will be used to des-



COLOR markings for identification of various types and grades of steel bars is not new. But method developed by Joseph T. Ryerson & Son, Inc., is. Chief advantages are: easier to apply, and easier to remember.

ignate free machining alloy steels as the 4100 series, or the 8600 series. Tool steel bars are painted full length, unlike carbon bars which are identified only at one end.

The most widely used carbon steels will continue to use previously established color coding. Green markings will identify C-1018 and C1020: blue will identify C1035; vellow will identify C1042. Thus an especially ground alloy steel bar would be marked partially black, denoting an alloy steel in the 4100 series. A yellow segment of the end would indicate carbon content is .40 pct to .50 pct. A red spot would designate the special surface condition. If the yellow is a centered dot, it would indicate that the bar has been heat treated.

Often, the basic idea behind marking warehouse steel has been

largely aimed at making handling simpler for the warehouse itself in setting up its own inventories. The Ryerson plan is aimed specifically at giving the customer an easily identifiable bar once it has been put on the racks in his own steel storage bays. Each shipment will be accompanied by a card explaining the entire color code system, and Ryerson sources, in response to the comment that the array of colors might be confusing, said they believe the system can be quickly and easily learned.

In the crossfire of disagreement over the years, many a color coding system has died. It's dead certain that a multitude of government specifications covering marking of military steel have produced more confusion than contentment when the marked bar reached the end users' inventories.

#### **SCREW PRODUCTS:** How To Buy Better

You can improve your machine screw products by working with supplier . . . Discussion with supplier can often cut costs and improve results . . . Examples of improved procurement—By T. M. Rohan.

◆ THE ARCHAIC slogan "Make your supplier a partner" may sound like one of the original 10 commandments of industry. But it was probably never more true or more frequently ignored than in the screw machine products industry today. And it's costing parts buyers money in quite a few cases.

Last week in Cleveland, for

example, a screw machine products customer ordered a large quantity of special shoulder bolts of 1018 steel. Quoted price was \$243 per thousand. The parts maker requested and was granted a consultation with the company design engineer. He asked if there was any special reason for the 1018 steel and was told "because it's cheaper." The salesman

pointed out that if leaded steel was satisfactory, he could quote a lower delivered price due to faster machining time. As it ended up, the leaded steel was satisfactory and the final price was down 30 pct or \$171.

Easy to Do

In another case, specifications called for tolerances of 0.003 in. in the runout between the shank and head on 15-in. bolts. Again the boltmaker was able to confer with engineers and found there was 1/8-in. clearance and little necessity for the close tolerance. If the close tolerance had to be maintained the price could have doubled or tripled the total the final \$5 cost.

And comparable savings are possible on use of the screw machine shop's own steel on concentricity, rolled threads, closeness of thread to bolt shoulders, and dozens of others. Although it's all in a day's work for the producers, the problem is serious enough for the National Screw Machine Products Industry, representing 270 producers or 70 pct of the industry, to compile a Buyers' Guide for design of screw machine products.

Company Problem

A number of screw machine products sales representatives contacted in Cleveland agree the whole problem boils down to a purchasing agent's problem within his own company. The gamut of types runs from those who merely hand out drawings from Engineering with a "do it like it says," and "how much" to those who concede the parts maker can offer a constructive suggestion and solicit them in print on the drawings.

Yet screw machine products

## How To Cut Screw Machine Tool Casts

Tolerances

hreads

Hole Diameters

Finish

Second Operations

Gages

If your parts are standard to you, order large quantity. Inventory cost may not be as much as extra cost of smaller lots.

Select most easily machined material consistent with actual use of part.

Specify no closer tolerances than necessary.

Specify, where possible, American National or Unified threads. Consumer will want parts made for interchangeability.

Use hole diameters obtainable with standard drills and reamers to avoid special charges.

If part is not seen, or does not move, and requires no close fit, finish is inconsequential. Do not specify the unnecessary.

Avoid unnecessary operations.

Furnish gages if possible, Investigate mechanical air or electronic types for better efficiency. salesmen, though most of their order books are now at all-time highs, feel they can do a constructive job with a minimum interruption. And because of the huge quantities in which these small parts are often ordered, a little time spent on consulting pays off all the way around.

#### Much Can Be Done

Yet in the realms of design, drawings, grinding, burring, concentricity, plating and heat treating, finishing, inspection, over-runs and under-runs, deliveries, threads and tapping there are real improvements to be made.

One very common misconception among customers, for instance, is that if they furnish bar stock from their own inventories, the price will be cheaper. They reason this because they buy at mill price and most parts suppliers buy in smaller quantities at higher warehouse prices. This tendency has grown in the last three months, especially among smaller capitalized companies.

But most machine screw products people feel the original raw material price advantage evaporates in machining costs because the stock furnished is seldom exactly right, wrong lengths interrupt feeding of machines and they can better rely on their own steel from regular steel suppliers. Hot rolled bars seem to be another price favorite. Yet on screw machines their scale affects tools. size inconsistencies raise hob with final sizes and lengths are not often ideal. Obviously it all shows up on the price tag.

#### Shipments Up

Business seems to be holding up well for screw machine products manufacturers. Shipments during last reported month, March, hit highest level they have reached since September 1953. They were 3 pct over previous month and 11 pct higher than March 1955. New orders were also on the rise, 11 pct higher than February.

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#### ALL-BASIC: All for Keystone

Illinois producer is first to go to all-basic openhearths... Results show more heats with less repair and maintenance... May be start of trend.

• "WE ARE very much sold on the principle that basic roofs for the openhearth are practical." With these words, A. H. Sommer, vice president, operations, at Keystone Steel & Wire Co. launched the push that will make the Peoria, Ill., steel producer the nation's first openhearth shop having all of its furnaces equipped with basic roofs.

Keystone, with a total of four openhearths, installed its first allbasic furnace two years ago, using what was then regarded as somewhat of a departure from conventional practice in using a flat roof on its new furnace. In March of this year, Keystone announced a second all-basic openhearth, and last week indicated that a third was on order and that the company's complement of four furnaces will be entirely equipped with basic roofs in the opening months of 1957.

#### Wide Interest

Keystone is a relatively small mill (425,000 net tons annually) but larger producers have been studying the economics of the allbasic openhearth with increasing favor. (IRON AGE, Sept. 22, 1955.)

Almost coincidentally with Keystone's announcement came word from Inland Steel that its own allbasic openhearth, in operation since January, is meeting advance predictions from the operating departments. The all-basic required only a patch after 189 heats of steel. A conventional silica brick roof furnace in the same openhearth shop has an average roof life of 141.5 heats and requires more patching (and consequently more costly down time) after 75-100 heats.

It is worth noting that even after 189 heats, the patch job was

required only over the single furnace door used for hot metal input and entry of the oxygen lance. Inland confined furnace entry of any type to the single door to reduce the number of areas that would require early patching. The idea seems to have worked.

At U. S. Steel's South Works, No. 10 openhearth is the experimental leader in the use of the allbasic. It is equipped with refractory brick roofs and side walls having brick of a higher chromemagnesite content than the silica bricks used in the roof and side walls of conventional openhearth furnaces. Number 10 began pouring steel in 1947, has since produced evidence that increases in steel output of as much as 10 pct over conventional openhearths are possible.

The adoption of the all-basic furnace by Keystone should indicate that the higher cost of chrome-magnesite brick types as opposed to the standard refractory bricks of great silica content is not the economic stumbling block.

#### It Pays Off

The Keystone Steel & Wire decision certainly doesn't indicate that the steel industry will switch in toto, either now or in the foreseeable future, to all-basic furnaces in the openhearth shops. But there are many steel men in the mills today who will recall the switch from acid hearth brick in the openhearths to basic brick. And the Keystone move is the first major move to indicate that a steel company is convinced, at both operating and management levels, that the higher initial cost of an all-basic furnace is more than absorbed by subsequent economies.

The question now: who's next?

#### CHEMICALS: Metalworking's Big Market

Chemical industry's rate of growth is fastest of any major industry... It creates big markets for expansion programs and metals as raw materials... Will multiply 5 times by 1975—By G. G. Carr

♦ IT'S HARD to keep up with the hyperthyroid chemical industry. One of metalworking's major markets, its past growth rate has been the most rapid of any major industry, and its expansion plans for the immediate future are button-popping.

Since 1925, production of industrial chemicals has grown nearly three times as fast as total industrial production. Sales of chemicals and allied products have zoomed from \$4.339 billion in 1939 to \$20.377 billion in 1955. Industry expansion since World War II has already accounted for more than \$11 billion for new plant and equipment.

Manufacturing Chemists' Assn. recently completed a survey of 599 projects for new chemical plants to be built during 1955-57 at a cost of \$2.3 billion. Of these projects 269

or \$772 million are already in place. And this is by no means the end. A Stanford Research Institute study predicts the chemical industry in 1975 will be five times its 1950 size, when value added by manufacture for the industry was \$7.2 billion.

#### How Big?

How big is the market for metalworking? You can be sure it's huge, but it takes a little imagination to pinpoint it. The industry is so diverse that detailed figures for one plant might have little value for another.

But some trend figures show the way: Purchases of metals and metallic minerals for use only as chemical raw materials rose from \$203 million in 1947 to over \$260 million in 1953. In 1952 the President's Materials Policy Commission

estimated that between 1950 and 1955 construction of new petrochemical facilities alone took: steel 784,000 tons; cast iron 24,600 tons; ferroalloys 45,200 tons; nonferrous metals 9,440 tons.

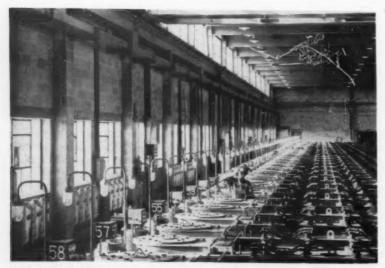
The chemical industry's purchases of fabricated metal products are as varied as the industry itself. Expansion figures for the industry probably include a lower-than-usual amount for brick and mortar, for in many cases the equipment forms its own building. Much of the equipment is custom built, often by small fabricators.

#### Material Needs

Again, case histories give good indication of what individual plants may need in the way of standard items. Take, for example, the Mc-Intosh, Ala. plant of Olin Mathieson Chemical Corp.'s Industrial Chemical Div. This plant, built in 1951, is a medium size plant for the manufacture of chlorine and caustic soda by the Mathieson electrolytic mercury cell process. O-M cautions that no chemical plant can really be called typical, but adds that, save for the graphite and mercury, this plant may be representative.

Bill of materials for this plant includes: iron and steel 3,271,000 lb; copper 200,000 lb; mercury 380,000; concrete 16,000,000 lb; cement bricks and blocks 70,000,000 lb; electrical wiring 75,000 ft; pipe 119,000 ft; electric motors 400; electric switches 600; electric conduit 10,000 ft; graphite 164,000 lb. Power consumption—sufficient to supply 43,000 normal homes.

American vendors are exporting an estimated total of 10,000 to 12,000 tons of metal products for the \$25-million fertilizer plant now being put up in Korea by McGraw-Hydrocarbon, a joint venture of



BOOMING industrial chemicals industry has leaped to the foreground as one of metalworking's major markets. Metal tanks in McIntosh, Ala., plant of Olin Mathieson Chemical Corp., are electrolytic mercury cells used in the production of industrial chlorine and caustic soda.

F. H. McGraw & Co. and Hydrocarbon Research, Inc. When completed in 1957, the plant, sponsored by International Cooperation Administration, will supply nearly one-third of Korea's plant food needs. American metal products in the plant include: structural steel 900 tons; tanks 1800 tons; reinforcing bars and misc. iron 600 tons; rail (on plant site) 250 tons; exchangers and condensers 300 tons; reactors 500 tons; carbon and alloy steel pipe 975 tons, electrical conduit 50,000 ft; cable 175,000 ft (approx.); switchgears and transformers 575 tons; electric motors 200 (approx. Range from 1/4 to 2000 hp); power generating equipment 40,000 kw-enough to light a

#### Where's the Market

Where is the market? As the accompanying table shows, the Middle Atlantic States in 1953 led with 134,828 production workers and value added by manufacture of \$2,558,100,000. Next was the East North Central area, with 116,303 workers and manufacture value of \$2,044,073,000. Third was the South Atlantic area and fourth the East South Central.

city of 25,000.

#### Where Is The Chemical Industry?

(1953 Totals)

Regions	Production Workers	Yalue Added By Manufacture
New England	21,253	\$ 324,102,000
Middle Atlantic	134,828	2,558,100,000
East North Central	116,303	2,044,073,000
West North Central	29,950	520,151,000
South Atlantic	94,305	1,377,453,000
East South Central	52.644	738,812,000
West South Central	44,937	1,113,184,000
Mountain States	11,165	121,804,000
Pacific States	30.739	522,669,000
Total	536,124	9,320,348,000

Fastest rate of growth, however, was in the Mountain States in the period 1947-53. There volume of production rose a whopping 4820 pct in the period. This growth is even more phenomenal when compared with the second fastest growing area, West South Central, with a growth rate of 148 pct.

Largest segment of the industry is industrial organic chemicals with 298,600 workers as of Dec. 31, 1954. Second largest is industrial inorganics with 97,000 workers and third, drugs and medicines with 92,600.

A word of caution is appropriate. Don't be mislead by worker totals. The chemical industry has been one of the leaders in automation.

#### Few Workers

This explains why most chemical plants are small in terms of number of workers. Some 96 pct of all plants have 249 or less employees, and this category comprises 38.5 pct of all employees. It may take a little extra shoeleather to cover the industry, but the fast-growing market deserves it.

#### Patents:

## Inventors flood office with applications

◆ THE FAST PACE of U. S. industrial expansion is swamping the U. S. Patent Office with 375,000 applications a year until it is now over 220,000 behind. The average time for granting is out to about 4 years, according to U. S. Patent Commissioner R. C. Watson.

In Cleveland last week Mr. Watson told a Patents and Invention Week audience that electronics applications are coming in at an ever increasing rate, outdistancing the office's Chemical and Mechanical sections. Despite the avalanche, about 40,000 patents will be granted by the end of this fiscal year, thanks to addition of 300 examiners. About 115 more, principally recent college engineering graduates taking night courses in law

in Washington, have been added and 200 more are hoped for by July 1.

#### Corporations Lead

Altogether, it would seem corporations are getting most of the patents. Mr. Watson said their volume is 60 pct and many of these are purchased from independent inventors prior to granting. Unfortunately, a healthy segment of engineers still spend considerable time and money developing ideas, only to find they have been fully patented a decade ago.

Better use of patent library facilities around the U. S. would minimize this. The department also strictly adheres to the policy of impartial treatment of all applications regardless of origin and the amount of money invested behind it.

Total patents turned out so far, since the first one was signed by George Washington in 1790, now

#### RESEARCH

amount to 2.7 million and another 2 million have been turned down in that period.

The Cleveland meeting was a 4-way sponsorship among the Cleveland Engineering Society, National Association of Manufacturers patent committee, and American and Cleveland Patent Law associations. It was the 25th conference in 8 years but attendance of 150 was far under the 600 in Hartford, Conn., 2 years ago.

Fred B. Foulk, New York, N.A.M. committee executive, said that his group is firmly opposed to, and attempting to get changes in, the present Atomic Energy act patent provisions. In the N.A.M.'s opinion, they offer little incentive to industry.

#### LME: Its Worldwide Price Influence

London Metals Exchange has a major effect on nonferrous metals prices... Offers to sell and buy are reflected in remote corners of the world... How U. S. producers and users compete—By F. J. Starin.

◆ IN A LARGE building on Whittington Ave., a commercial section of London, men gather every weekday, officially in the morning, but unofficially in the afternoon.

Some bid, others offer—and the price of copper, lead, zinc and tin fluctuates accordingly in remote corners of the world. Whether agreement is reached or not, their actions are published, and reflected in the price domestic mills and fabricators pay for comparable metals.

This is the London Metals Exchange—oldest and most significant metal commodity market in the world.

A spotlight has been thrown on this group in the last month by Anaconda Co. and Kennecott Copper Corp. action of pricing domestically marketed copper produced in Chile on weekly average of LME. The effect of this market on domestic price structure actually dates back to the turn of the century with exception of World War II emergency, when government

bought all imported metal. Copper trading was last to be resumed in August 1953, and almost immediately began to affect the U.S. markets. The peak of its influence was 1955.

Serious strikes in all major producing countries reduced the expected world supply. LME price went up, while U. S. producers attempted to hold a line.

Chile, world's second largest producer, established an official government policy of sending two-thirds of its output to London for the greater return. The result was a crippling copper shortage in this country. The Anaconda, Kennecott decision to bring price of Chilean copper into line with LME, coupled with an oversupply in London is bringing more copper to U. S.

Also during 1955, zinc and lead producers anticipated LME to avert a shortage. Domestic prices were raised because of an upward trend in LME prices. The action wiped out any thoughts that vital

Canadian and Mexican sources might have had about shifting bulk of their shipments to LME.

LME and U. S. industry are in almost direct competition because of several key factors: (1) These are the major markets for all producers of copper, zinc, lead and tin. (2) During times of high industry activity, like 1955-56, U. S. mines and refineries can not turn out enough metal to meet domestic demand.

#### Which One?

Selecting market which permits the greater return is by no means cut and dried. A producer must also decide whether he prefers U. S. dollars or pounds sterling. U. S. dollar is usually held in higher regard, so that U. S. prices need only match LME.

LME is governed by a 15 man board of directors under control of Metal Market & Exchange Co., Ltd. The fact that much of the trading is hedging and speculation is officially recognized and condoned by the group. Hedging is considered to be "increasing the growing international trade of the country," and in addition encompasses a buy as well as a sale. This, on paper at least, boosts the volume of metal flowing through the exchange.

Irresponsible gambling is discouraged, but speculation is viewed as a "legitimate form of enterprise."

The effect of LME trading on U. S. prices is not a one way street. J. D. Wolff, chaîrman of the Metal Market & Exchange Co., Ltd., declared that LME prices were higher at the end of 1955 because of the pressure of the expanding demand by U. S. industry.

#### LME: How Many Tons Are Traded?

London Metals Exchange is chief competition of U. S. Industry for world nonferrous metal output. But not as much metal is traded as you may think.

#### **COMPARISON FOR 1955:**

	copper	zinc	lead	tin
LME Traded U. S. consumption	277,063 1,410,000	230,135 1,007,619	166,006 1,175,000	35,654 95,000
				*chart tone

Of course LME statistics are only for the official recorded session in the morning, Unofficial afternoon transactions are similar in total tonnages.

#### Approval:

#### Armed Forces seek way to drop costly activities

Pentagon lawyers have been given the task of devising a method for the armed forces to lop off certain business-type operations without clearing each action with Congress.

Congressmen generally are leery about the effects of closing or curtailing military activities, including those of commercial nature, in their home areas. They now require the Defense Dept. to get approval of appropriations committees in the House and Senate before discontinuing projects that have been performed for three years or lenger by civilian employees.

Defense Dept. has a program requiring study of armed services operations which might be performed more cheaply and efficiently by civilian firms under contract or abandoned entirely.

Most of the work proposed for dropping is of small business type, according to T. P. Pike, Assistant Defense Secretary (Supply & Logistics). The list includes automotive, office furniture, and shoe repair shops, bakeries, and nurseries. Small though they are, he says, it's a tedious job to explain to Congress why they should be closed.

Rep. Scrivner, R., Kans., suggests a solution, calling on the Defense Dept. to draft proposed dollar limits for business-type activities the military could shut down or transfer without congressional clearance.

#### Selenium Export

Applications for licenses to export selenium commodities during the third quarter must be filed between June 1 and June 15, the U.S. Bureau of Foreign Commerce announces.

At the same time, the BFC says that applications to export aluminum and copper materials must be submitted by June 16 in order to be considered for second-quarter licensing.

Selenium commodities affected are powder; metal, except sele-

nium-bearing scrap; salts and compounds, including selenium dioxide; salts of organic compounds; selenium-containing pigments; selenium-containing rubber compounding agents, not of coal tar origin; and ferroselenium.

Aluminum and copper commodities affected include new and old aluminum scrap; aluminum remelt ingots; new and used copper scrap; new and old copper-base alloy scrap containing 40 pct or more copper, except copper nickel alloy scrap with 40 pct or more copper and 5 pct or more nickel (which may not be exported) and copper-base alloy ingots and other crude forms.

#### Missile Contract

The Atlas, intercontinental ballistic missile (ICBM), reported designed to fly 5000 miles at 10,000 mph, will be built in San Diego. And with a hydrogen warhead, it would be the deadliest weapon known—reach Moscow in 30 minutes.

Convair Div. of General Dynamics Corp. got a U. S. Air Force green light for a \$41 million one-million-sq-ft plant. Ground-breaking for the new plant will take place this month—with production of the Atlas to start October 1957.

DEFENSE

The new plant will employ about 6600 workers. Where they'll get them is a big question.

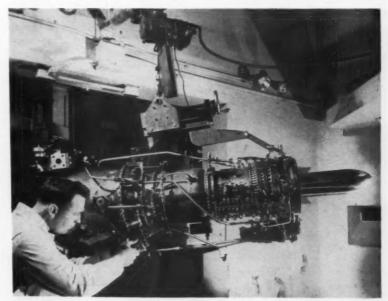
The Air Force will pay \$20 million of the construction cost and Convair \$21 million.

#### Nuclear Insurance

Congress will begin hearings soon to find if some form of federal insurance protection must be set up before private industry can move ahead in atomic power.

Hearings will be before the Senate-House atomic energy committee, starting the week of May 14. The committee is asking for comment on a bill proposing a Government indemnity program to supplement private insurance.

Reports to the committee, according to Chairman Anderson, D., N. M., maintain that the lack of complete public liability protection is an important obstacle to rapid building of an industryrun system of atomic power plants. It is essential to remove any barrier to progress.



TURBOSHAFT T58 engine built by General Electric for Navy Bureau of Aeronautics packs more than 1000 hp in its 59 in., 325 lb frame. T58 also boasts an unusually low specific fuel consumption. Engine is being tested by GE's Small Aircraft Engine Dept., Lynn, Mass., for use in helicopters.

#### Diamonds:

### Carboloy is manufacturing them successfully

Detroit pilot plant of General Electric's Carboloy Department has been making steady progress in bridging gap between laboratory-made industrial diamonds and the production line. Man-made diamonds now are being produced at the plant in limited quantities.

J. S. Gillespie, manager of Carboloy's diamond project stated that they have come a long way since the first diamonds were made at GE's Schenectady research laboratory in 1954.

Two main areas of concentration now are production of the diamonds in quantity and at a marketable price. Gillespie estimates the industrial diamond business as having a \$200 million potential within the next decade—providing the cost of man-made variety can be brought down below those now being mined.

This potential is augmented by

increasing demand for high production of interchangeable parts which must be held to very close tolerances, he said. Diamonds are used for finishing these parts and for shaping and dressing grinding wheels that produce these tolerances.

#### Eastern Stainless

Eastern Stainless Steel Corp., Baltimore, is planning to invest over \$5 million for expansion of production facilities, including new melting equipment.

Company intends to raise the necessary capital by giving its common stockholders a chance to subscribe to 15 year Convertible Subordinate Debentures. Registration statement has already been filed with SEC.

Breakdown of the project: \$2 million for additional melting facilities, \$500,000 for new building construction, \$750,000 for a 30-ton electric arc furnace and related equipment, \$400,000 for cranes and handling equipment.

#### **Liquid Metal Reactor**

Babcock and Wilcox Co. will design, fabricate, and operate a new type experimental nuclear reactor using liquid metal fuel for the U. S. Atomic Energy Commission.

Liquid metal-fueled reactor will be the seventh type in AEC's electric power research and development program. Newest type offers potential advantages of flexibility of operation over a wide power output range, simplified fuel processing, and steam conditions comparable to those in modern conventional generating plants, AEC says.

Union Carbide Nuclear Co. will be one of the major sub-contractors for Babcock and Wilcox, primarily in the processing of fuel.

#### **Expansion Briefs**

Cooper Alloy Corp., Hillside, N. J.; expansion of facilities including additional 7800 sq ft of foundry area and modern equipment; cost about \$2 million.

Sterling Die Div., Pratt & Whitney Co.; new plant in suburb of Cleveland; expected to triple capacity.

Automatic Switch Co., Orange, N. J.; new plant at Florham Park, N. J.; expected double capacity of present plant.

Yoder Co., Cleveland, has taken an option on suburban property for proposed construction of new plant; approximate cost \$5-\$7.5 million.

U. S. Steel Corp., new sintering plant at Houseville, Pa.; expected capacity about 15,000 tons of ore daily.

Fruehauf Trailer Co., will construct new truck-trailer manufacturing plant near Ontario, Calif.



CONTROL PANELS regulating all climatic situations for York Corp's new compound compression heat pump system are fully automatic. As weather changes, these controls keep inside temperature at desired level.

Another production improvement with DENISON MULTIPRESS



### Multipress® Automation turns out 48,000 assemblies a day

Denison Multipress pierces, forms, cuts off, positions and spot welds stainless strap to washers

100 assemblies per minute . . . that's the production turned out by one Denison Multipress at International Business Machine Corporation, Poughkeepsie, New York.

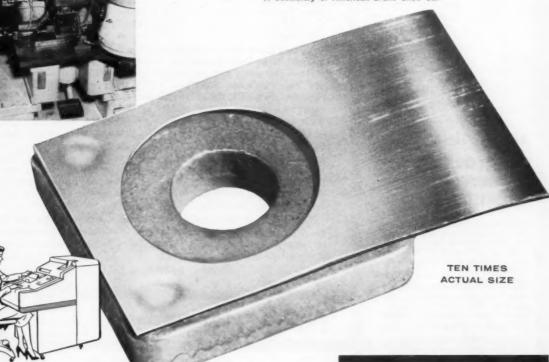
Stainless steel tape is fed through a hitch feed into a punch and die set where it is pierced, shaped, and cut off forming a damper guard to cushion the action of a relay armature. It is then positioned under welding electrodes and welded to a square steel washer.

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For the first time, detailed plant site data is now available covering the Nation's newest and most promising industrial frontier—New York State's Seaway Land. Created by the St. Lawrence navigation and power projects... Seaway Land comprises an area that pulses with opportunity.

Within three years, completion of the Seaway navigation project will give to New York State's many Seaway ports—and the areas they serve—the ready and economical access to the world's raw materials and the world's markets. Trade routes to the seven seas will connect, in Seaway Land, with the great and smoothly efficient system of railroad, highway, air and inland waterway facilities already functioning in New York State.

The St. Lawrence power project now being built by the New York State Power Authority will be the largest hydroelectric power installation east of the Mississippi. Its power will start flowing in 1958. And the expansion of Niagara power in the near future will add more new power than that generated by the St. Lawrence. Add to these the constantly growing generating capacity of the private utilities, and Seaway Land becomes the nation's power center.

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### **NEW YORK STATE**

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### REPORT TO MANAGEMENT

### How Are They Taking It in Detroit?

"I've seen it a lot worse, but a lot of people are out of work and the others just aren't spending." That's the reaction of a Detroit cab driver to a routine "How's business?" conversation opener.

There's no doubt any more

that things aren't going as well as the auto industry would like to have you believe. Even the strained optimism of the typical auto executive is beginning to wear thin. (See Automotive Assembly Line, P. 68.)

But while it would be

putting your head in the sand to ignore or underestimate the Detroit situation, it is equally dangerous not to see it for what it's worth in the long term.

#### The Long Look is Good

Don't forget to consider automakers' plans for capital spending and expansion if you feel depressed by sales and dealer inventory stories. Except for the possibly incurable plight of the independent as a significant production factor, there is no lack of confidence.

Plans for new buildings, new

and improved tooling and manufacturing methods are going ahead with possibly increased zest. Part of it is to cut costs and improve competitive position through lower manufacturing costs. But that isn't all. A lot of the money is being spent for increased productive capacity. Despite the 1956 sales slump, which is due to factors other than the general economic welfare of the potential customer, the industry knows it will have to grow to meet future demands.

#### It's Short Term Pessimism

Among the Big Three, seldom was long range confidence ever higher. And, it may be surprising to hear that third place Chrysler has as much confidence as the others. Chrysler has made a terrific

comeback. Even though it may not be up to announced goals, top management believes it is now fully competitive in manufacturing, product, and management. The company has undergone an internal reorganization that defies description, now feel it has the combination to grow slowly into a sounder third position.

#### What's the Reaction to Washington?

It also might be surprising, but GM is outwardly not as concerned about the trust talk from Washington as might be expected.

At one time a few years back,

executives were told to soft pedal any talk of "bigness," market percentages, and the like. That is not the case today, in spite of what might be a natural tendency to do so.

Even if you believe that

GM may be ordered to divest itself of GMAC, its financing subsidiary, or any other operation, no hint of that will come from any level in company. That official and outward attitude might be expected anyway, but the giant automaker is putting up a solid front.

#### What's This About Hard Money?

The "Fed's" recent increase in discount rate is generally lauded by the financial interests as a blow against inflation. It is also interpreted by Wall Street as an indication that the concern is over inflation, not recession.

But it's difficult to believe

that the financial experts arrived at that conclusion only at this late date. With shortages in metals, credit money, and even labor in many areas, the danger of inflation has been apparent to any curbstone economist.

Not everyone shares Wall Street's

enthusiasm for the discount rate boost. There is the other danger that higher cost of borrowing may have the effect of slowing down expansion and capital improvement programs.

THE

### INDUSTRIAL

Saved By the Bell . . . An approved manual fire alarm system, designed for multi-story structures has been developed by Edwards Co., Inc., Norwalk, Conn. The system indicates the location of the fire, and effects immediate evacuation of students or employees, can be used for simple testing and scheduled fire drills. Manual alarm stations are operated by a single action, promote immediate transmission of alarm.

American in Pittsburgh . . . American Chain & Cable Co., Inc., has opened new facilities in Pittsburgh. District sales representatives for the following divisions will be included at the new office: American Cable, American Chain, Ford Chain Block, Hazard Wire Rope, Pennsylvania Lawn Mower, R-P&C Valve, and Wright Hoist.

Paper Change... The Industrial Power Division, International Harvester Co., Chicago, Ill., is now known as the Construction Equipment Div. The change applies to name of division only and does not affect personnel or line of equipment.

It's Now Spring . . . Crucible Steel Co. of America has formed a division for the fabrication and sale of steel springs, will be known as the Spring Division. The new organization combines all previous existing Crucible spring fabrication and sales activities including Spring Works, Pittsburgh, and the Company's Railroad and Spring Sales Division.

Steel Holmes . . . The Northern Ohio Chapter of America Steel Warehouse Assn. will be headed by William R. Holmes as president for the 1956-57 year. Mr. Holmes is Cleveland district manager of U. S. Steel Supply Div., U. S. Steel Corp. Electronic Banking . . . Bank of America, San Francisco, has contracted with General Electric Co.'s Electronics Div., Syracuse, N. Y., for the manufacture of electronic computers for the bank's multimillion-dollar computer program.

Selling West . . . Industrial Materials Co., San Francisco, distributors of abrasive, chemical, sanding and grinding equipment, has been appointed distributor for the Bay Area, Central and Northern California by Speed-D-Burr Corp., Glendale, Calif., manufacturer of precision barrel finishing equipment.

Visual Aid . . . A slidefilm instruction course designed for training of industrial personnel in the selection and application of modern electric and electronic control equipment is available from the General Electric Co.



"Not only is he well groomed, but he'd make a dandy one!"

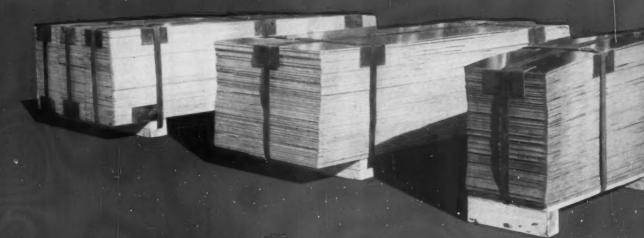
Whose Best Friend? . . . Manmade industrial diamonds are being produced in limited quantities at the Detroit pilot plant, General Electric's Carboloy Dept. Commercial diamonds are being consumed at the rate of 12 million carats a year representing a \$50 million business, with well over 80 pct of these, by weight, going into grinding wheels, the balance in rock drills, wheel dressers, metal cutting tools and dies, according to the manager of Carboloy's project.

Flying High . . . Jack & Heintz, Inc., national designer and manufacturer of electric systems and components for aircraft and missiles, reports receipt of new orders totalling approximately \$1.6 million.

Medalist . . . Department of Commerce Silver Medal for Meritorious Service has been awarded to Herbert C. Vacher, head of the metallographic and X-ray diffraction laboratory, at the National Bureau of Standards, for his contributions to the field of metallurgy.

Lifter Pushers . . . Cady Metal Fabricating Co., North Tonawanda, N. Y., manufacturers of Cady pallet lifters, has appointed as new distributors Pennsylvania Sling Co., Pittsburgh and Cleveland; John C. Johnson Co., Philadelphia, and T. F. O'Donnell Co., San Francisco.

Keep 'Em Rolling . . . Alco Products, Inc., manufacturers of diesel engines and locomotives, has opened a new warehouse in the Vail Field area of Los Angeles County to provide a stockpile of more than 7,000 parts to give Alco customers on the West Coast prompt service on replacement and renewal locomotive and engine parts.



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plate steels • tillage steels • soft
center steel • knife steels • sow steels,
including high speed back saw blade
steels • Tour-Cross steel • heutresisting steels • stainless steels
• lang Actual stainless-clud steel • forging
quality electric steel ingets • form
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### AUTOMOTIVE ASSEMBLY LINE

### Auto Sales Lag Won't Go Away

So GM using price bait to jack up orders for '56 models . . . Curtice hints probable higher prices for '57 cars . . . Others may join chorus—By Tom Carry.

· AUTO INDUSTRY executives have just about run out of excuses for the lag in production this year and are now at the point where they are trying to bolster sales wherever possible.

It is obvious that the industry overestimated the size of this year's market and made too many cars in the last quarter of 1955. The public is not too interested in the warmed over versions that were presented as new models this year. When new car stocks grew, production was cut back and layoffs in the Detroit area, at least, increased. At first, the opinion was that when spring arrived, sales would naturally increase as they have in other years. But spring was late getting here. The weather has remained unseasonably cold and the upturn in sales has not materialized.

As a result, the industry is at the point now where remarks are being dropped at every opportunity to help the sale of new cars.

First was the insistence by Harlow Curtice, president of General Motors, that the 1957 cars are not going to be radically different from this year's models. Mr. Curtice wants to lure more people into the market who might be tempted to wait because of predictions of big changes in the works.

Price Angle . . . Then, Mr. Curtice has criticized the tendency to tighten credit regulations by insisting that restrictions are not necessary because the amount of credit extended has not reached the danger point. None of this talk has helped very much but the industry has an ace in the hole

and is at the point where it is beginning to play it. The one thing that could serve as a stimulant to this year's market is price.

So far, little has been said about it and what has been said has been largely ignored. However, the condition of the market has reached the point where it cannot be overlooked any longer.

Last month, Mr. Curtice hinted at the possibility that the price of next year's cars was going to be higher. He based his opinion on the foregone conclusion that there will be a healthy increase in the price of steel. Mr. Curtice didn't say specifically that prices are going up but said he believed it is possible.

Blames Steel Prices . . . Just last week, another GM executive said the same thing. Edward T. Ragsdale, general manager of the Buick Div., said that the price of 1957 models would increase and he also blamed it on steel.

There are three possible reasons why Mr. Ragsdale made the remark. First, he could have been smoothing the way for the steel industry to raise its prices. Then again, he could have spoken off the cuff without giving too much thought to what he said. Or he could have been aiming his words directly at that portion of the motoring public that has made up its mind to wait for introduction of the new model cars before coming into the market.

The third reason seems the most likely. Automobile companies feel no obligation to help out the steel industry, and Mr. Ragsdale is too well versed an execu-

### Washington Merry-Go-Round

- " Stanley N. Barnes, head of the Antitrust Div. in the Justice Dept., says his agency opposes a bill designed to stop new-car bootlegging, a second aimed at curbing phantom freight charges, and a third to give exclusive sales areas to franchised dealers. All three have been discussed at recent hearings before a House Commerce subcommittee.
- \* The very fact that congressional hearings have been held

- on these subjects has caused auto manufacturers to make changes in franchises, pricing methods, and dealer relations. says Mr. Barnes.
- At the same time, Mr. Barnes again rapped the Big Three auto companies. He said somebody is going to have to "do something" about GM, Ford, and Chrysler accounting for 95 pct of auto sales. He said this concentration threatens existence of the small independents.



### How Great Lakes Steel puts the pressure on quality



COILS ARE ANNEALED in these giant ovens to impart maximum softness and ductility. And then . . .



COILS ARE TEMPER ROLLED in a skin mill to give the stiffness, surface and flatness which have been specified by the customer for the order.

Right on the nose—not too hard, not too soft! This steel coil passes the Rockwell Test with tolerance to spare.

In the Rockwell, or hardness test, pressure is put on a sample piece of coil by a system of loads applied through a tiny ball. A needle gauge signals the depth of the impression. From this, our test engineers can readily tell: (1) if the coil was annealed to maximum softness for extra-deep drawing; and (2) if it is now properly tempered to meet customer specifications.

Quality control every step of the way—yes, that's our most important job at Great Lakes. Reason enough to call us and talk over your steel needs?

#### **GREAT LAKES STEEL CORPORATION**

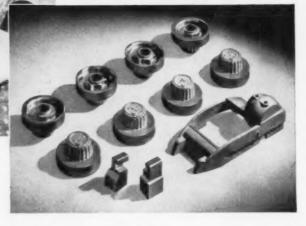
Ecorse, Detroit 29, Michigan . A Unit of



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



**CODUCTION SHORT CUTS** 



### SEWING UP A PRODUCT DESIGN AT SINGER

Part of the story behind the development of the Singer Automatic Zigzagger (an attachment for use with Singer sewing machines) reveals howthrough the use of ZINC Die Castings-efficiency and economy can go hand-in-hand. The castings in the new assembly are shown at the right.

The first consideration in developing the Zigzagger was to establish a basic design which would permit milady to simply and efficiently create a variety of decorative effects merely through the interchange of different stitch patterns. The ultimate design called for some unusually shaped components which led Singer engineers to the specification of ZINC Die Castings. These parts are the cover frame, two presser bar seats and the eight interchangeable stitch patterns.

The economy of die casting the Zigzagger components stems from high speed multiplecavity production, achieving dimensionally accurate, ready-to-assemble parts. The eight stitch patterns are cast with the sewing design engraved on each pattern head and, as can be seen in the underviews, unusually shaped cam tracks also are obtained on these castings. The smooth surfaces of the ZINC Die Cast cover frame require little

preparation for a handsome

paint coating.

For possible answers to your production problems, send for our brochure and contact any commercial die casting company.

4 Send for your copy.

The New Jersey Zinc Company, 160 Front Street, New York 38, N. Y

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality)

#### **Automotive Production**

(U. S. and Canada Combined)

WEEK	ENDING		CARS	TRUCKS
MAY	5,	1956	127,615	25,166
APRIL	28,	1956	138,322	24,902
MAY	7.	1955	182,864	32,892
APRIL	30,	1955	195,586	32,892

\*Estimated. Source: Ward's Reports

tive to speak out of turn on any subject as touchy as prices so early in the game.

Chorus May Grow . . . What it boils down to is a concerted effort, on the part of General Motors, at least, to stimulate the sale of its 1956 products as much as possible. If sales don't pick up soon, the rest of the industry will soon be joining GM and singing the same tune.

#### Ford Forum

A group of some 50 engineering educators will participate in the first annual Ford Motor Co. engineering forum which will be held in nearby Dearborn next month.

Object of the forum, according to Earle S. MacPherson, will be to find a solution to the critical shortage of engineers. Specifically, Ford will try to find out what engineering schools and industry combined can do to alleviate the condition, which is not confined solely to the automobile industry.

Ford hopes that by acquainting the educators with the company's problems it will be possible to arrive at some system by which the shortage of technically trained personnel can be overcome.

### Highway Bill Outlook

Hopeful highway users—shippers, truckers, and the motoring public—look to the Senate for approval of principal points in a proposal, backed by the House, to construct a vast, modern system of roads at a cost of more than \$51 billion.

Basic terms of the House-backed bill carrying the building plans probably will gain Senate endorsement, perhaps late this month. There is some chance of a stalemate, however, when the senators consider such thorny passages as those on prevailing wage rates and reimbursement for utilities relocation.

It is likely, despite these hazards, that conferees from both sides of Capitol Hill will be smoothing out their differences on major highway legislation sometime in June. A highway bill that President Eisenhower will sign will be in the President's hands before July 1, Sen. Gore, D., Tenn., predicts.

#### The Figures

As the proposed plan now stands, federal investment in the three classes of roads named would total \$725 million in fiscal 1957. The House also agreed that the funds should be raised to \$750 million in fiscal 1958 and \$775 million in 1959.

Federal tax increases on fuel, tires, trucks, buses, and trailers are calculated to yield more than \$14 billion in the next 16 years. This revenue is to become a substantial part of the \$37 billion-plus the federal government would pay in the highway program, as now contemplated. Meanwhile, the old highways continue to jam.

#### AUTOMOTIVE NEWS

### Honor for Keller

His important contributions to military research in connection with guided missiles earn for K. T. Keller, chairman of the board of Chrysler Corp., the Army's Exceptional Civilian Service Award.

Mr. Keller now is a member of the Army scientific advisory panel. From 1950 to 1953, he directed the Defense Dept. guided missiles program.

### **Plenty of Sheets**

After about a year of the toughest scrambling for steel, buyers for the auto industry are able to relax.

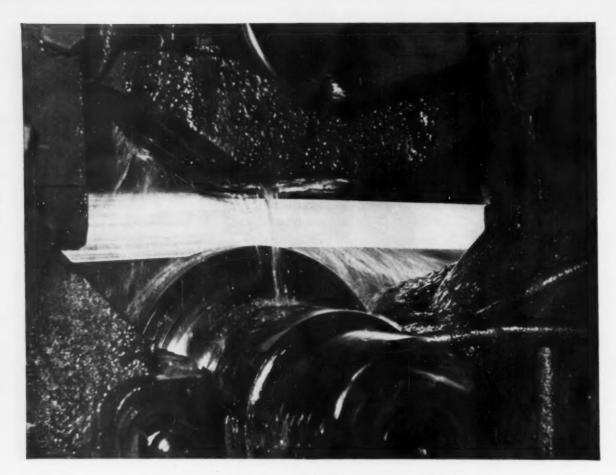
There are some tight products, of course, but in Detroit the major concern is always sheet. If there is a comfortable sheet inventory, purchasing agents start planning their vacations or fishing trips.

One steel buyer flatly tells THE IRON AGE that his company is "up to its ears" in steel, the traditional remark that signifies an easier market. For some, it is a welcome respite.

#### THE BULL OF THE WOODS

By J. R. Williams





# Use the lube that can carry the load

Whatever metal you're rolling, reduction gears and their bearings will run smoother and cost you less for maintenance when Texaco Meropa Lubricant is on the job. And there are good reasons why—

Texaco Meropa Lubricant has special extreme pressure properties that enable it to withstand shock loads and continued heavy duty service—for longer periods than other lubricants. This is due in part to polar additives that enable Texaco Meropa Lubricant to cling tenaciously to metal under all conditions—even immersion in water.

In addition, Texaco Meropa Lubricant resists oxidation, thickening and foaming. It will not separate in use, storage or centrifuging. It is non-corrosive to bearing metals.

A Texaco Lubrication Engineer will gladly help you get maximum efficiency from all your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.



TUNE IN . . . TEXACO STAR THEATER starring JIMMY DURANTE on television . . . Saturday nights, NBC.



### Wilson Backs LeMay on Big Bombers

B-52, 8 jet super bomber to get inside track on materials and engineering talent... Long range goal is 500 planes... Of the 78 delivered thus far 31 have been rejected.—By G. H. Baker.

◆ LAGGING B-52 bomber procurement program is about to be jarred into fast action. Secretary of Defense Wilson now agrees with Gen. Curtis E. LeMay, chief of the Strategic Air Command, that the 8-jet super bombers must be given an inside track on all materials and engineering know-how.

Long-range goal of the Defense Department is construction of about 500 of the giant bombers. But shortages and "bugs" in the performance of certain components (undisclosed) have held down to only 47 the number of B-52s accepted by the Air Force. Actually, 78 have been delivered, of which 31 were rejected by the Air Force. LeMay insists that this is bound to improve since they now have the solution for the prevalent trouble.

LeMay and Wilson want to increase the size of B-52 bomber wings from 30 to 45 planes. Latest increase in the rate of output should permit achieving of this goal by mid-1958.

B-52s cost about \$8 million apiece. They are designed to replace the B-36 bombers now in service.

### Congress Wonders Why

Two tax-writing committees of Congress are somewhat startled by the recent rash of protests against the income tax. The squawks are against the rates for individuals as well as for corporations. Both are at or near wartime levels.

What politicians can't understand is why people are grumbling in these relatively good times. Cloakroom circles insist that production and sales are high, every person who wants a job either has one or can easily get one, and personal income is rolling in at healthy rates. The recent outbursts against income taxes appearing in newspapers and popular magazines just don't fit in with a politician's concept of voter contentment.

Many congressmen don't seem to see what voters do—the inherent dangers in any high tax that shows signs of becoming a permanent part of the nation's tax structure. Initiative suffers. Expansion plans are shelved. Individuals and companies alike are reluctant to keep striving when they know the government will take \$8-\$9 out of every \$10 earned in some brackets. (Corporation rate is now 52 pct of income over \$25,000; rate for individual ranges high at 91 pct.)

Thirty-one state governments have already indicated to Washington that they want to place a ceiling on the income tax. Most of these believe 25 pct of a personal or corporate income should be the limit of federal taxation. Legislatively, there is little or no hope that Congress will recognize these state appeals this year, but the fact that 31 states are questioning the present set-up is giving federal tax experts some food for sober thought.

### Don't Spend It Yet

Treasury Department officials will make known their revised estimates of spending and revenue May 20. Some election-conscious politicians are reviving talk of personal tax cuts, but chances are that taxpayers won't receive any relief this year.

There is a strong probability

### U. S. Scientists And Engineers Going To Russia

- It looks like another round of exchange visits for U. S. and Soviet experts. This one will involve scientists and engineers.
- U. S. State Dept. has already approved proposed visit to Moscow of 14 scientists this month. Other such junkets now in proposal stage likely to get same favorable consideration.

And current Russian policy will probably favor U. S. trip for few hand picked representatives.

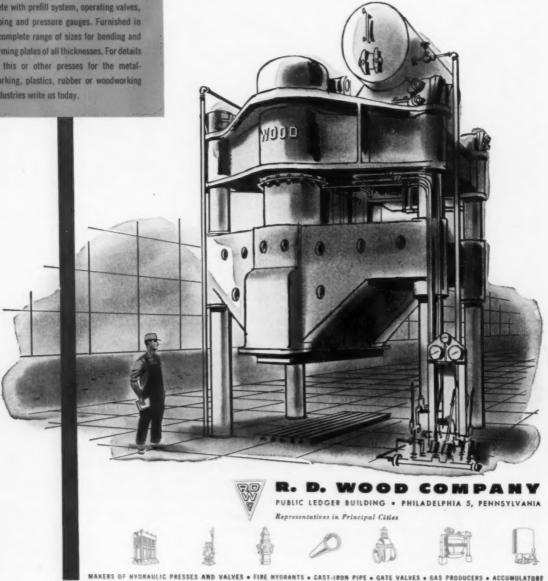
Moscow conference, May 14 to 20 will discuss high energy nuclear physics—atoms under tremendous pressure. But AEC is sure no secret information will be involved.

1500-ton Heavy-Duty Forming Press for bending and forming operations on heavy steel plate. Moving platen can be tilted right or left during stroke. Furnished complete with prefill system, operating valves, piping and pressure gauges. Furnished in a complete range of sizes for bending and forming plates of all thicknesses. For details of this or other presses for the metalworking, plastics, rubber or woodworking industries write us today.

### You'll like what it does to production

It's just plain common sense-when your down-time decreases your production is bound to increase. Down-time can't be eliminated, but R. D. Wood presses hold it to a minimum. The meticulous design, choice materials and careful craftsmanship

that go into a Wood press produce a superior producta dependable, smooth-working press that can't help but increase production records. Products with the Wood stamp of quality have been piling up production records for more than 150 years.



that earlier estimates of a \$200 million budget surplus this year will prove to be conservative perhaps by as much as \$3 billion. Corporate and personal income tax collections so far this spring are running far ahead of Treasury estimates.

If this is true, and the government finds itself with from \$1 to \$3 billion in surplus, there is little chance that President Eisenhower and the conservatives in Congress will be able to hold back a taxcutting steamroller.

Should Congress attempt to pass out some tax plums, it's almost a sure bet that President Eisenhower will veto the measure, with the approval of factions of both political parties. He has made it clear right along that if there is a surplus, it should be used for debt reduction.

If the economy continues to boom, tax-cut opponents will base their arguments on the inflationary effects of a tax reduction

### Credit Curbs:

### Aimed at Business not Consumer borrowing

Recent government tightening of bank credit is designed to dampen excessive business exuberance rather than to curb consumer spending. But it is slowing some types of retail sales.

Purchases of heavy appliances, automobiles and other items normally purchased with installment credit have felt the shock of restricted credit brought on by higher interest rates.

This wasn't the principal effect the government money-managers had in mind. Officials say they are not quite as concerned now as they have been about overextension of consumer credit. Families have been paying off their debts faster than they did last year, bringing a decline in consumer credit outstanding in both January and February. Total is expected to climb again this spring, but at a slower rate.

But businessmen have apparently started on a credit binge of their own, borrowing \$1.1 billion in the first three months of this

year for new plant, equipment, inventory, and store modernization. In the same period last year, businessmen went in hock for only \$200 million.

As a result of the new round of tight-money actions, many businessmen are finding it harder and more expensive to get funds. That's what the government wants.

Business speculation, another round of wage increases, and impending price rises in many basic raw materials—including steel—are giving an inflationary lift to the economy even more serious in the eyes of the fiscal experts that did the free-wheeling credit spending spree that consumers engaged in most of last year.

### **Patent System Change**

American inventors will be able to press claims to their devices and processes before a new patent court of appeals with far-reaching authority, if a new bill offered in Congress becomes law.

At the same time, patent applicants are encouraged to push their patent requests as fast as possible, and to avoid deliberate delays that would prolong their monopoly beyond the legal limit. A second new bill calls for a stricter interpretation of the maximum term for sole rights to a patent.

Both measures are introduced by Sen. O'Mahoney, D., Wyo., who calls for greater uniformity in court rulings on patent cases. He believes the answer is creation of a special court to handle appeals.

### WASHINGTON NEWS

This five-man tribunal would be named by the President, with the consent of the Senate.

It would have jurisdiction over appeals from decisions made by the Commissioner of Patents and various Patent Office boards concerning patent and trademark applications and actions. Its authority would not extend to decisions of the U. S. Court of Claims, nor to cases subject to U. S. Supreme Court review.

The bill covering the duration of a patent would limit it to a maximum of 20 years from the date the application was filed or 17 years from the date of issuance, whichever is shorter. Less delay between the times of filing and issuance is expected to result from planned changes in the handling of patent requests.

### Warehouses Obsolete?

An airlift on a major scale will be tried out in July when the U. S. Seventh Army in Germany will test a new Pentagon plan for supplying overseas forces.

The plan involves eventual scrapping of overseas warehouses as "potential A-Bomb targets." Supplies will be carried by air and sea.

Army planners indicated that if field trials proved successful existing warehouses and depots would gradually be eliminated.

### It's a Convertible—SUB to GAW

- Walter Reuther is making it very clear that supplemental unemployment pay plans are only step in the right direction.
- Reuther says that United Auto Workers will drive hard this year to get SUB converted into "100 pct Guaranteed Annual Wage."
- UAW will also push for shorter work week, Reuther revealed.

# Ingenious Toolingversatile H-P-M



### Convair Adapts Standard H-P-M 1000 Ton For Stretch Forming

Here's proof of the unlimited versatility of H-P-M hydraulics. In this unusual application, Convair Division of General Dynamics Corp. of San Diego, use an H-P-M all-hydraulic 1000 ton double action press for stretch forming aluminum Convair-Liner dorsal fins. The accurately controlled hydraulic pressure of the H-P-M press throughout drawing and clamping action assures proper metal forming over a plastic die. Equipped with the time-proved H-P-M FAST-RAVERSE Closed Circuit hydraulic system, dependable H-P-Ms offer the solution for most tough metalworking problems. Nearly 80 years of experience stand behind thousands of these H-P-M presses now in production all over the world. Call in a nearby H-P-M engineer at the planning stage. He may be able to save you real money.



H-P-M all-hydraulic 1000-ton FASTRAVERSE sheet metal drawing press equipped with a 400-ton blankholder and 250-ton die cushion.

THE HYDRAULIC PRESS MFG. CO.





### **Irrigation Primes Pump Sales**

Iron Age survey shows turbine pump market headed for another big year . . . Agriculture biggest user . . . But industrial sales are growing . . . New specs cited—By R. R. Kay.

◆ A BIGGER market for turbine pumps! Nineteen fifty-six sales will top last year's high of \$75 million. It's in the cards, based on an IRON AGE survey of turbine pump manufacturers here.

This will be welcome news to suppliers to the pump industry. And especially good for local foundries. They get some \$8 million in business from West Coast.

U. S. factory and farm owners will look this way for the bulk of their turbine pumps. Why? The region makes 70 pct of the country's supply.

What Did It?... Turbine pump use has come up fast in the past few years. And the future looks even more promising. Volume continues to swell. Biggest buyer: agriculture.

How come? Farmers in the East and Southeast are getting the word: drill wells and install pumps for supplemental water supply. It makes for higher yield per acre. The days of Rebecca at the well are long gone. Irrigation wells, equipped with turbine pumps, assure a steady water flow.

Likely trend: development of underground water supply for irrigation as a necessity rather than as a supplemental supply.

New Materials . . . Industrial uses are growing, too. Turbine pumps are showing up more and more in cooling tower applications. They're coming into their own in chemical plants, paper mills, and the oil industry. And there's increasing demand for general booster-service use.

As industrial demand grows,

there's a noticeable shift in the materials that go into the pump. Standard for many years: cast iron pump bowls, impellers, heads; steel eduction pipe and shafting; bronze impellers. Today you'll find more stainless steel or some other alloy in pump bowls and impellers; and mild steel fabricated pump heads.

Castings, incidentally, represent some 25 pct of total weight of all materials in the finished turbine pump unit.

### **Electric Rumors**

Rumors are flying fast and furious that Bethlehem Pacific Coast Steel Corp. has blueprints ready for three 100-ton electric furnaces to go into its South San Francisco Works. This will be welcome news when it's official.

### Aircraft Pickup

Just about a year ago these giants: Boeing, Douglas, Lockheed, had anywhere from zero to 15 pct in commercial transport orders. It's a lot different now.

Box score of commercial business today: Boeing, 16 pct, \$400 million; Douglas, 40 pct, \$935 million; Lockhead, 34 pct, \$432 million.

The latest totals on backlogs, both commercial and military: Boeing, \$2.6 billion; Douglas \$2.4 billion; Lockheed, \$1.3 billion. Grand total: \$6.3 billion!



MINIATURE FIRE TRUCK in use at Consolidated Western Steel Division of USS, can have stream of water on a blaze anywhere within the 87-acre plant in three minutes. An electric scooter, it carries crew of four.

### **Backbone for any job...**

### "Solid-Back" Column

... New Kearney & Trecker **7** Series milling machines have it... backbone for the precise tool room job and... plenty of beef for rugged duty milling

TF Series milling machines available under Tool-Lease program.

A few more of many reasons why **F** Series milling machines are way out front in rigidity



Twin Screw Knee Support Exclusive double-support errongement most effectively distributes weight of new mochines' much wider, heavier knee, soddle and table. Balanced design substantially increases stability under heaviest loads . . . offers greater resistance to torsional thrust under all cuts . . haives the wear factor, assuring greater, longer-lasting accuracy.



Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways are increased considerably, providing fuller saddle support... lasting accuracy... substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life , excellent finish . , quieter and vibrationless operation under all cuts.

THE solid-back column is an outstanding example of Kearney & Trecker advanced engineering. This one-piece, cross-ribbed, solid-back column is the most important single element of the machine. Every inch of metal is scientifically distributed to add rigidity where it's needed the most. Thus the column readily absorbs all the heavy work loads supported by the heavier, wider knee, and also all torsional thrusts to the cutter transmitted through the heavy-duty, three-bearing spindle and double overarms.

What's more, the heavier column base is specially designed for the new, exclusive twin screw knee support—the only balanced-design arrangement offered today.

In addition, the new TF's give you other outstanding design and operating features, never before available on any knee-type milling machines. TF milling machines are built in five sizes — No. 2 to No. 6 from 10hp to 50hp in Plain, Universal and Vertical styles.

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### Turn The Spotlight On Machine Tools

Builders claim current situation is all talk and little or no action . . . Vance Plan for defense buying dropped . . . Theory of new idea sound, but there's big "if"—By E. J. Egan Jr.

◆ MACHINE TOOL builders are getting a little annoyed at excess of talk and lack of action on the problem of machine tools for defense production.

They've heard one top Pentagon official after another declare that (1) the next war would probably not allow time for a gradual build-up to maximum arms production, (2) the military should have plenty of modern machine tools to cope with the job of winning a quick, decisive war, (3) something should be done about getting these machine tools ordered and built.

But so far, very little has been done. Builders keep trying to stimulate buying action. It's not that they really need the business; most of them are doing very well with civilian customers. But they know that special equipment needed for volume arms production takes many months—well over a year in some cases—to design and build.

Underground ... Until recently, actions by the armed forces to modernize their machine tool reserves were out in the open. This was when buying was done according to the "Vance Plan." Procedure was to ask Congress for specific fiscal-year sums for new equipment.

In January of this year the "Vance Plan" was abandoned. Reason given by defense officials was that according to the plan, all equipment bought had to go into reserve status.

Now that this stymie has been removed, military men say the way is clear to (1) buy the new machine tools needed for present defense programs, (2) channel the older tools now in use into a reserve category.

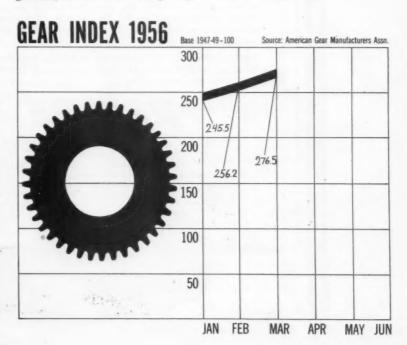
Builders approve the new plan in theory. They know that their new equipment models will outperform older types military is now forced to depend on. But will these new machine tools actually be bought and put to use?

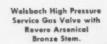
Big "If" . . . That's a big question, because machine tool appropriations will no longer be specific as they were under the Vance Plan.

A single sum will be requested, let's say for "Operation Cyclone," mythical Air Force project. If granted, it will cover everything involved in getting that project underway, contracts for engineering, buildings, raw materials, paper clips—and machine tools.

Builders' big fear is that metalworking equipment just might get lost in the shuffle. Someone could decide that older equipment was available to do the job, and, this being the case, a heavier share of the available lump sum could be used to buy office furniture.

Builders consider their products so important to national defense that they want the spotlight turned back on machine tool appropriations and expenditures. And they want it kept on. As a starter they suggest a current, detailed summary of all programs.





### REVERE

### **Deep-Drilling Brass Rod**

Increases Tool Life over 200% for Welsbach Why not try it yourself?

In the manufacture of valves the Kitson Division of The Welsbach Corporation, Philadelphia, Pa., has to deep-drill brass rod. Originally the rod was free-machining brass. However, when Revere discovered the extent of the drilling it was suggested that our Mixture 252, Deep-Drilling Brass, would be preferable. This was tried, and the machine shop foreman reported that tool life was increased over 200%. In one item it is possible to bore with a single operation, against the former practice of withdrawing the drill three times in order to clear the chips. Revere's Deep-Drilling brass produces very small, easily cleared chips.

Another item is a high pressure gas valve, with a cast body and brass rod stem. The rod was changed to arsenical bronze, which costs a bit more, but it ended flaking and galling between stem and seat, and materially reduced rejects. Still another instance of Revere service concerns a hot water heater relief valve. The original model was cut out of bar stock. We suggested a high leaded brass tube, hexagon outside, round inside. This greatly reduces machining, has a better surface, and a better seat. Costs more by the pound, but saves more by the piece.

Revere salesmen and Technical Advisors are always glad to collaborate in seeking ways to save money and improve products. Perhaps we can help you!

### REVERE

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Welsbach Temperature-Pressure Relief Valve.

Pressure Relief Valve



### The Iron Age

### SALUTES

Frederick C. Crawford

President and chairman of Thompson Products Co., he anticipated the need for diversification as far back as 1933; helped his company become the largest single employer in Cleveland.

The deft hand of Frederick C. Crawford has lent its golden touch to many diverse enterprises and institutions, ranging from Thompson Products Co., of which he is chairman, the Cleveland Zoo, the Hoover Commission and possibly even to the golf game of President Eisenhower.

A native of Watertown, Mass., Fred Crawford migrated to Cleveland after graduating magna cum laude from Harvard, in 1914—and Cleveland has never been the same since.

Asserting his aggressiveness, Fred Crawford talked his way into a maintenance engineer's job with Thompson Products Co. in 1916 (then Steel Products Co.), overcoming objections that a college graduate was too good for the job. Seventeen years later he was the firm's president. Seeing the precariousness of specialization in manufacturing, he began a farsighted diversification program at Thompson Products in 1933. The company now is the largest single employer in Cleveland.

During the hectic war year of 1943, his foresight and executive ability earned him the presidency of the National Assn. of Manufacturers. Consequently, he was appointed to serve in numerous federal agencies, and currently he is a sub-committee chairman of the National Advisory Committee for Aeronautics.

In spite of these vital duties, Fred Crawford still finds time to hear the problems of individual employees. On occasion he has halted board meetings in order to iron out the complaints of a disgruntled worker.

His interests range from crawfishing to collecting antique automobiles. And last year he went with his wife and another Cleveland couple on a big game hunt in Europe for the Cleveland Zoo, capturing 38 animals and birds. It might be safe to assume that even President Eisenhower has benefited from Fred Crawford's uncanny ability to improve anything he comes in contact with. You see, the President has played golf with Crawford several times.



Ohio Steel representatives show you how with

The Ohio Roll Representative who calls on you knows the metal industry, production processes and his products. He can tell you what you need to know about performance, life, hardness and relative strength of rolls. His recommendations are supported by technical data developed by Ohio's engineering, chemical and metallurgical departments. He knows rolls, and he knows that OHIO ROLLS give long, profitable service under critical operating conditions . . . because they are delivered only after exhaustive chemical and metallurgical tests and minute inspection.

When you need rolls—large or small—call in your Ohio Roll representative. He can help you solve your roll problems quickly and efficiently.



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### shaping metal for all industry

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Chilled Iron Rolls © Denso Iron Rolls © Nickel Grain Rolls © Special Iron Rolls
Nicloy Rolls © Flintuff Rolls © Forged Steel Rolls

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio

### The Iron Age INTRODUCES

George C. Wilder, elected president, MacWhyte Co., Kenosha, Wis. E. C. Berg, elected vice president and controller; F. D. Holden, elected vice president, sales; Goodwin Johnston, elected secretary and treasurer.

G. W. Trichel, elected president, Amplex Div., Chrysler Corp., Detroit.

Henry M. McAdoo, Jr., elected vice president, manufacturing, Nice Ball Bearing Co., Philadelphia; John J. Larkin, named plant manager; Thomas E. Spence, named chief engineer.

Edgar Washburn, elected executive vice president, American Engineering Co., Philadelphia; W. C. Miles, elected vice president and general manager.

Russell F. Schreiber, elected executive vice president and treasurer, E. H. Titchener & Co., Binghamton, N. Y.; T. W. Whipple, named vice president, sales; Edward T. Wayne, named vice president and director, engineering; Elsie R. Schaefer, named secretary.

Kenneth A. Perko, elected treasurer, The Perry Cap & Set Screw Co., Cleveland.

Wayne C. Tustin, appointed supervisor, air-break switch engineering, Santa Clara Plant, Pacific Switchgear Div., Federal Pacific Electric Co., San Francisco. Roger A. Yoder, elected vice president, Detroit Steel Corp., Detroit; John A. Hartman, elected treasurer; Nathan H. Siegel, elected secretary; George A. Longeway, named controller; Lloyd W. Bicking, named assistant treasurer.

Charles C. Morley, elected treasurer, A. P. Green Fire Brick Co., Mexico, Mo.

L. Ovid Sperry, named assistant superintendent, North Plant Dept., The Granite City Steel Co., Granite City, Ill.; David W. Boyles, named assistant to superintendent.

William J. Vonah, named district sales manager, New York offices, The Erie Forge & Steel Corp., Erie, Pa.

Dr. George McCoy, named manager, Research & Development Dept., Pennsylvania Salt Mfg. Co., Philadelphia.

W. Frank Bort, named manager, industrial construction, Kaiser Engineers Div. of Henry J. Kaiser Co., Oakland, Calif.; Stanley Kimball, appointed manager, heavy construction.

Alfred P. Terna, named technical advisor, Standard Rolling Mills Div., Revere Copper & Brass Inc., Brooklyn, N. Y.

Benn G. Hale, named assistant district sales manager, Southern California, Delta Power Tool Div., Rockwell Mfg. Co., Pittsburgh.



ROBERT G. WILLAMAN, elected president, Peterson Steels, Inc., Union, N. J.



W. C. HALE, JR., elected president, South Chester Corp., Dodge Steel Co., Lion Fastener Co., Inc.



FREDERICK WALKER, elected vice president, Federated Metals Div., American Smelting & Refining Co., New York.



FRANCIS H. EICHLER, elected vice president, Purchasing Dept., American Smelting & Refining Co., New York.



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For 10-lb.-pig users, this new ingot means no free-carbon pockets, finer grain structure, more even melting. Available in all grades, silvery and HannaTite — an extra-close-grain iron.

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D. W. Rice, named product sales manager, Conduit Div., National Electric Products Corp., Pittsburgh.

F. W. Ecker, Jr., named sales manager, Mechanical Handling Co., Seattle.

Wallace Schermer, appointed sales manager, Materials Handling Div., Union Steel Products Co., Albion, Mich.

Samuel A. Ott, appointed works manager, Claymont, Del., plant, The Colorado Fuel & Iron Corp., New York.

Philip R. Smith, named assistant manager, Sheffield Michigan Sales Corp., Detroit.

Henry R. Dansereau, named district sales manager, Nevada and Northwest California, Delta Power Tool Div., Rockwell Mfg. Co., Pittsburgh.

Benno W. Nitz, appointed sales manager, Fuel Appliance Div., Turner Brass Works, Sycamore, Ill.

John B. Hinds, named specialist, planning and methods, Foundry Depts., General Electric Co., Elmira Foundry, New York.

Following appointments are within the engineering section of the Silicone Products Dept., General Electric Co., Waterford, N. Y. Dr. Stuart D. Brewer, named manager, resin product engineering; Dr. Frederick M. Lewis, named manager, advance development; Dr. Abott Pozefsky, named manager, analytical and control methods unit; Dr. William F. Gilliam, named specialist, technical information exchange.

K. Kelly Kennan, named district sales manager, San Francisco, Heating Appliance Controls Div., Robertshaw-Fulton Controls Co.



ROBERT H. MORSE, III, elected vice president, sales, Fairbanks, Morse & Co., Chicago.



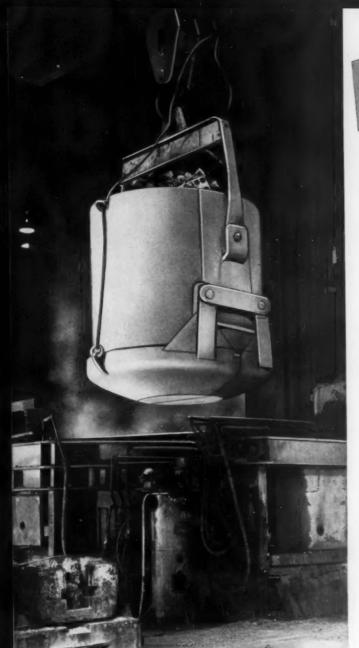
D. L. HARWOOD, elected vice president, sales, Fairbanks, Morse & Co., Chicago.



C. M. HORAN, named general superintendent, steel plant, Indiana Harbor Works, The Youngstown Sheet and Tube Co., East Chicago, Ind.



JOHN R. DAVEY, appointed manager, Metallurgist Dept., Acme Steel Co., Chicago.



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ing staff to the completion of the job.



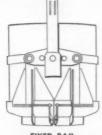
# STEEL PLANTS

### separate men from boys

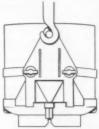
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Yes, in many cases where additional weight does no harm, we throw the specs out of the windowand you get a job that gives you a minimum of maintenance headaches for years to come. McGregor-Michigan Fabrications take their place among the "men" in primary metal plant equipment because we know they'll get slammed around and we build them to stand up to rough treatment!

Our clam-bottom scrap buckets, for example, have design and structural features which now set the pace for the industry and our engineering department is continually at work to make all such equipment more rugged, easier to maintain, safer, less costly. Some of the most progressive plants in the world tell us that our modern engineering service, backed by 115 years of heavy fabrication experience, has made a valuable contribution to their efficiency.



FIXED BAIL



REMOVABLE BAIL





Photos showing Red-Strand multiple-part (left) and single-part slings (right) in action.



A heavy cylindrical load usually calls for multiple-part Red-Strand Flat-Laced slings. They are strong, flexible and do not slip or abrade.

### How to Select the Correct Sling for Your Job

Start your sling selection by analyzing five factors:

- 1. The load-its size, weight, shape, finish.
- 2. Working area, amount of head room.
- 3. Size and type of crane hook.
- 4. Angle of sling legs.
- 5. Location and type of lugs or rings, if any.

From this information your supplier can recommend the sling by type, size and length that is safest, longest lasting and most economical for your job.

#### Types of Slings

Multiple-part slings are always recommended for heavy duty service, because for equal strength they are far more flexible than single-part slings. They hug the shape of the load easily, present a greater bearing surface to the load, and reduce the possibility of marring surfaces.

Where these factors are not so important, either Red-Strand single-part slings or grommet slings may be used for economy. Single-part Red-Strand slings are often recommended for lifting lighter weight objects, or those that have fixed attaching rings or lugs.

Grommet, or continuous strand Red-Strand slings are ideal for forming hitches of various types without fittings.

#### **Extra Savings**

Two suggestions will help you save money on slings

The first is to re-use Pin-Lock thimbles on multiple part slings. These exclusive Leschen Pin-Lock thimbles cut sling costs on an average of 21% because they may be used again and again. They lock into sling loops with pins instead of permanent clamps, permitting re-use, and eliminating constant expense of thimble replacements.

The second suggestion is to use Red-Strand slings because they are made of higher-than-rated quality Leschen wire rope that delivers long, economical

Get a copy of Leschen's Sling Handbook for complete information. Ask your Leschen man for one, or write

LESCHEN WIRE ROPE DIVISION H. K. PORTER COMPANY, INC.

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C. R. Welles, named sales manager, Hanna Furnace Corp., Detroit.

William L. Parlon, appointed manager, Milwaukee branch office, Baker - Raulang Co., Milwaukee: E. E. McVeigh, named manager, sales engineering, Cleveland.

John J. Thompson, appointed manager, Salaried Personnel Dept., Worthington Corp., Harrison, N. J.; Robert C. Hughes, named director, training.

R. P. Donnell, named district manager, Steel & Tube Div., The Timken Roller Bearing Co., New

Clayton A. O'Neill, named manager, Permanent Mold Div., The Wellman Bronze & Aluminum Co., Cleveland.

Patrick E. Dempsey, named chief metallurgist, Kensington Steel Co., Chicago.

Emmett E. Holmgren, named chief inspector, Ind. Harbor Works, The Youngstown Sheet & Tube Co., East Chicago, Ind.

Paul Pick, named chief engineer, The Allen Mfg. Co., Hartford, Conn.

Following were named sales representatives, Northeastern Steel Corp., Bridgeport, Conn. Louis A. Karg, Northern New Jersey; Cecil A. Cherry, Syracuse, N. Y.; Donald Thornton, Hartford, Conn.: David T. Landrigan, Boston-Worcester.

Benjamin E. Storrs, named carbide cutting tool specialist, Carboloy Dept., General Electric Co., Detroit.

Marlin H. Snow, appointed purchasing agent, The Ferry Cap & Set Screw Co., Cleveland.

Gordon F. Colson, appointed field engineer, Norton Co., Los Angeles, Calif.

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• The search for better ways of making seamless never ceases...just as it never ceases for merchant pipe, cold rolled, galvanized, bar stock or any other product.

The formula remains the same. You concentrate on improving operating techniques. We concentrate on improving equipment. Many of the ideas for equipment originate with you and reach maturity through joint effort with us. Many new ideas originate with us and are developed with you.

How about this year? At this moment, many of Aetna's engineering hours are being expended on new ideas in seamless equipment. You will be hearing about them . . . or perhaps you already have.

### AETNA · STANDARD

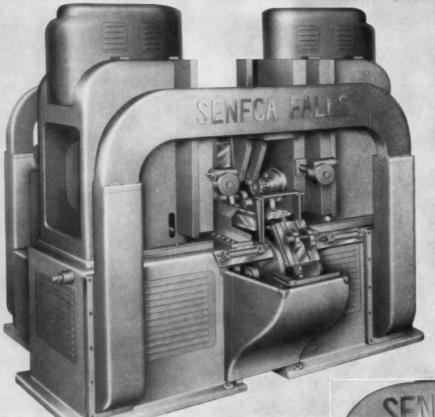
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# MACHINE OF



Write Seneca Falls Machine Co., Seneca Falls, N. Y. for Bulletin MX-F

Front view of Model MX Milling and Centering Machine showing milling stations. Loading and unloading of work pieces is done at this end of the machine, although an unloading station can be provided at rear of the machine if desired.

Rear view of machine showing centering station. Work carriers, attached to an endless chain, carry finished pieces horizontally thru the machine tunnel to the front loading and unloading station.

### MODEL MX DESIGN FEATURES

- ▶ High production, multiple station, fully automatic machine.
- Standardized tool carrying heads.
- Ease of tool and cutter changing.
- Automatic in-line work transfer from station to station.
- Automatic cycle interruption in case of overload on tools.
- Automatic rapid traverse movement for all tool heads.
- Ease of loading and unloading.
- Automatic power clamping devices.
- ► Hardened and ground ways for work carriers.
- Motorized chip disposal.
- ► Simplified maintenance.
- Manual push-button operation.



### THE MONTH

REPARED BY THE SENECA FALLS MACHINE CO. "THE SO-SWINGY PEOPLE" SENECA FALLS, NEW YORK

### NEW...SENECA FALLS AUTOMATIC TRANSFER TYPE, MILLING AND CENTERING MACHINE

• The new Seneca Falls Model MX Double End, Transfer Type, Automatic Milling and Centering Machine is designed to insure accuracy and reduce manufacturing costs on milling to length and centering operations by combining these operations on a single machine serviced by one operator.

The machine is of the horizontal, indexing transfer type with mechanical feeds and positive drive devices. Strength and rigidity characterize the massive base and columns which support the milling heads. The box type columns absorb vibration from heavy cutting loads imposed by carbide milling cutters operating at high cutting speeds and coarse feeds.

Double end, multiple work head design and construction maintains definite relations between milled ends and centers of the work pieces which are securely clamped on individual platens during the entire machining operation.

The machine illustrated is equipped for rough and finish milling operations as well as for the centering operations. However, design is such that single, face milling heads may be supplied in combination with other type heads for end milling driving slots in the face of the work pieces or for combined drilling, reaming, boring, threading and tapping operations in one or both ends of work pieces.

The Work Holding and Work Transfer Mechanism operates on the endless chain principle and the work carriers are indexed from one cutter head to another as the work pieces progress from the loading station to the rough

milling, finish milling and center drilling stations. All work carriers are stationary during actual machining operations.

SENECA FALLS MACHINE CO., SENECA FALLS, N.Y.

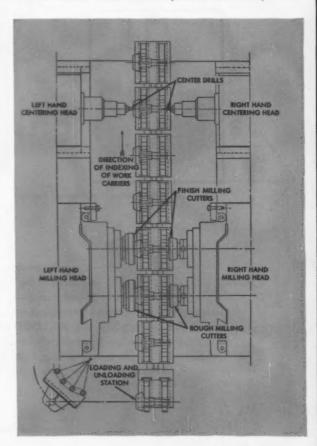


Diagram of flow of work pieces thru Seneca Falls Model MX
Automatic Milling and Centering Machine,

NEW LIGHTWEIGHT EC&M 55" MAGNET\*

 HANDLES LIGHT SCRAP AT LOWER COST

WEIGHS UP TO 25% LESS

- WITH COMPARABLE LIFTING CAPACITY
- FASTER OPERATION OVER WIDER WORKING RADIUS







This new magnet, developed by EC&M engineers, is the lightest weight 55-inch magnet. High

strength and water-tight construction are maintained with a completely ALL-WELDED design. Elimination of bolt-head recesses allows a better proportion for coil space, giving high lifting capacity. Welding also keeps pole shoes tight.

Introduced less than a year ago, the EC&M light-weight 45-inch magnet has already become popular because its faster maneuverability and greater working radius permit more trips per day. The new 55-inch magnet incorporates the same profitable advantages. Get the facts . . . and note how these lightweight magnets can cut your light scrap handling costs.

Write for Bulletin 900-L

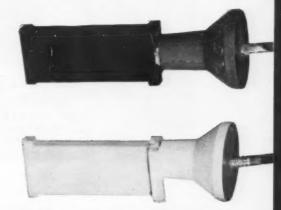


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FEATURE ARTICLES



New foundry process-

# Single Glass Mold Smoothes Casting Wrinkles

- New, all-in-one glass molds offer top precision, finer casting definition, and a blemish-free surface finish... All this, plus a versatility that permits casting all metals ferrous and nonferrous—in a common molding material.
- As refractories go, Glascast is a "natural" . . . Chemically inert, it boasts an extra-low coefficient of expansion for holding close dimensional tolerances . . . A short firing cycle provides for wax recovery, drastically cuts furnace time.



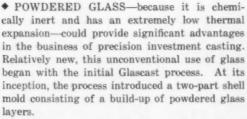


By P. M. UNTERWEISER, Metallurgical Editor

The wax pattern — here stimulating a jet engine blade — is an important factor in obtaining close dimensions and good surface finish.



The casting slip (right) contains fine glass powder and water. Mold is built layer-by-layer, starting with initial dip in liquid slip.



But because a split mold was involved, there was always the potential problem of parting line variations. In precision casting especially, this can pose a troublesome variable. Creating a non-separable, single glass mold was the ultimate objective, and the latest Glascast development meets it head on.

Since glass is a very common refractory material, the notion of putting it to work in foundry applications seems logical enough. But credit for the development—and particularly its most recent refinement—is due the Corning Glass Works, Corning, N. Y.

Corning has been constructively tinkering with the idea for a number of years. Its potential no longer restricted to the laboratory, the latest Glascast single-mold process was introduced at the AFS Congress and Exhibit held at Atlantic City, May 3-9.

Corning's interest in glass and its extended use is easy to understand. But the foundryman—especially if he isn't a glass expert—is likely to ask: "Why glass?" What, specifically, can glass offer to the improvement of precision molding and casting techniques?

Judged strictly on its merits as a refractory, glass has at least two outstanding attributes. For one, it has extreme chemical stability in

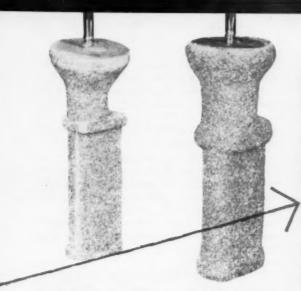


Powdered glass is sprinkled over wax pattern wetted with slip. Glass is fused by firing.

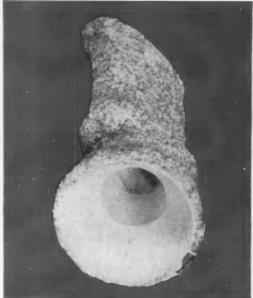
contact with molten metals. Its stability need not be qualified or restricted to just certain metals. This means that any of the commonly used metals and alloys can be poured in glass molds without the kind of chemical interaction that frequently results in serious pitting, surface attack, and loss of dimensional accuracy.

Low thermal expansion is equally important. It is this property that most critically affects the dimensional accuracy of the casting and the success or failure of the technique:

For with precision castings, extremely close tolerances are always a prime consideration. Precision investment castings are relatively ex-



Starting with the slip layer no thicker than an average coat of enamel, the mold is strengthened by adding several layers of powdered glass. The finished mold thickness will range from 1/8 to 1/4 in., depending upon application.



pensive. Their principal justification is dependent upon an accuracy that will reduce subsequent machining operations to an absolute minimum.

In combination, these and other properties of glass molds claim to result in closer dimensional control, excellent surface quality, and elimination of spalling and cracking. Ultimately, they are intended to produce a better casting with an amazingly low rejection rate.

### Coat with slurry

The new, single mold process starts with a standard wax pattern—a replica of the final casting. Although the pattern can be made of any one of a number of common waxes, it must be capable of maintaining dimensional accuracy at

room temperatures. As a rule, waxes used for this purpose have a melting point not lower than  $120^{\circ}F$ .

The wax pattern is cleaned in acetone to remove surface grease and provide good wetting properties. It is then dipped in the Glascast slurry or "slip." This solution contains water, special additives and extremely fine glass powder. It has a fairly low viscosity and covers the pattern's surfaces with ease.

When the pattern is properly covered, the next step involves removing the moisture from the slip film. This drying action can be accomplished in air at room temperatures in 10-15 minutes. Use of ammonia will accelerate the process, reducing drying time to 2-3 minutes. (Corning's laboratory feeds bottled ammonia to a simple



"Selling points include 2-min.
dewaxing cycle, total firing time
of less than 15 minutes . . ."

drying cabinet fitted with an exhaust to draw off the fumes.)

After drying, the initial glass layer is quite thin—probably no thicker than an average single coat of enamel. To provide necessary strength, it is essential that mold thickness be increased. Consequently, the original film is reinforced by dipping again in the aqueous slurry. But while the new coating is still wet, Glascast powder is sprinkled over the wetted areas. The powdered material adheres and gives added body to the mold form.

Once again the glass-coated pattern is dried. At the conclusion of this drying cycle, however, the makings of the glass mold are more substantial.

A few more dips in the slurry, followed in each instance by sprinklings of glass powder, build a multi-layered mold of considerable strength. Mold thickness requirements are dependent principally upon the size of the casting. Even a fairly large precision casting is not likely to require more than seven separate coatings.

After the required coatings have been applied and are partially dried, a final drying operation is the next important step. This cycle normally calls for an 8-hour period at room temperatures. At its conclusion, glass mold thickness will range from  $\frac{1}{8}$  to  $\frac{1}{4}$  in., depending upon the casting application. Even at this stage, the unfired mold is fairly sturdy and does not present a ticklish handling problem.

#### Mold is fired

To obtain fusion, the glass mold surrounding the wax pattern is then fired at about 1920°F. Firing actually handles two jobs in a single operation. First, it goes to work on the wax. The wax pattern is completely removed within 2 minutes and, under proper conditions, the molten material can be readily recovered.

The glass—comprising millions of tiny particles—is gradually fused into a single, sturdy mold. Producing as accurate a mold as is presently obtainable, total glass firing time can usually be figured at about 15 minutes.

The firing operation is an extremely important detail, and Corning has already anticipated future requirements. They have come up with the type furnace needed to do the job. The upper portion of this vertical-type furnace handles firing. Each glass mold is supported on a high temperature stainless grid and positioned so that the wax pattern, when it melts, is free to fall to a lower section of the furnace.

Because of the extremely high furnace temperature, the wax pattern melts and flows in a matter of seconds. Wax loss is minimized because there isn't enough time for appreciable oxidation to occur. While retaining a high surface finish, the glass mold's internal surfaces are left free of wax contaminants.

Aside from the more obvious advantages derived from the use of glass, the new Glascast process should prove of great value in speeding foundry operations. Combining dewaxing and mold firing in a single, rapid sequence is certainly a case in point. Contrast the 2 minutes required for Glascast dewaxing with other techniques which call for as much as 16 hours for dewaxing alone.

A 10-15 minute firing cycle is another costsaving advantage. A number of conventional techniques require as much as 8-10 hours for satisfactory firing. Not only do the longer firing times slow production, but they also result in higher operational costs in terms of both fuel and/or power consumption and furnace maintenance.

### Low cost helps

The Glascast mold also contributes to operational simplification because it is capable of supporting its own weight during the firing cycle. There is no need for special props or fixtures to prevent sagging or mold distortion.

Glascast requires no knockout hammers or other mechanical means to knock off the investment after the casting is cooled. As both the glass mold and the enclosed casting cool to a temperature well below the melting point of the metal, the glass mold simply pops off the casting bit-by-bit. By the time the metal temperature is low enough for convenient handling, all of the mold material is fragmented and automatically removed from contact with the metal surfaces.

The new process may also have a distinct advantage in the matter of molding material costs. Because Glascast is brand new, Corning hasn't yet been able to survey the cost picture with the degree of completeness it deserves. Preliminary indications, however, seem to underline the possibility that Glascast may prove to reduce mold processing costs by as much as 50 pct.

On smaller castings, Glascast material costs appear to check out at about 25¢ per pound of cast metal. Although this figure is necessarily tentative, it is highly encouraging. Overall costs are little more than half that of many conventional techniques used for investment casting.

As is usually the case with any new process, Glascast has still to prove itself in the shop. Corning is confident that it will—with interest.

Reprints: From one to three reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The Iron Age, Chestnut & 56th Sts., Philadelphia 39, Pa,

### Giant Machine Gets

### **Extra Strength From Welding**

The job: Build a 5000-ton hydraulic straightening press capable of handling armor plate up to 20 in. thick, 50 in. wide . . . Delivery is tight, repeat orders highly improbable . . . Clearing Machine Co.'s answer: arc-welded construction.

It worked out well... Welding speeded construction, produced optimum strength-to-weight ratio, made an attractive job... Design principles, welding procedures embodied are applicable to a wide range of similar metalworking machinery.

By W. A. MORGAN, Clearing Machine Corp., Chicago

♦ IT'S OF ALL-WELDED construction — and believed the largest of its kind ever built.

Those are the principal points of interest in a mammoth 5000-ton hydraulic straightening press built by Clearing Machine Co., Chicago. Now installed at Lukens Steel Co., Coatesville, Pa., the monster press stands 36-ft 10-in. tall—more than 27 ft of this above floor level. Its assignment: Straightening armor and other plate up to 20 in. thick and 50 in. wide.

There were several reasons for deciding on arc welded construction. For one thing, it was clearly a one-time job—repeat or duplicate orders weren't likely. Delivery was tight, and there were obvious time and cost advantages in eliminating the need for patterns and castings. Also, welding would allow Clearing to hold weight to a minimum while realizing adequate strength, by varying plate thickness to develop strength where it was needed in the structure.

At the same time, welding left room for making minor changes in design as the work went

along, and helped turn out a unit with clean. modern lines and functional beauty.

In action, operators regulate all press motion by pushbutton from a central console (at right, Fig. 1). A massive ram over 4 ft in diam exerts straightening pressure. Actuating the ram is a 53-ton forged steel hydraulic cylinder, mounted on a carriage which travels on beams fixed to the uprights between crown and bed. This carriage can travel a full 180 in. from one side to the other, and exerts full 5000 ton pressure even in off-center loading positions.

Two motorized feed cars lug the heavy armor plate into and out of the press. Plate sections weigh up to 50 tons. Cars—also of all welded plate construction—move on tracks fore and aft of the press. Height of cars matches that of

This article is based on an award-winning paper submitted to the Machine Tool Design Competition sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland.

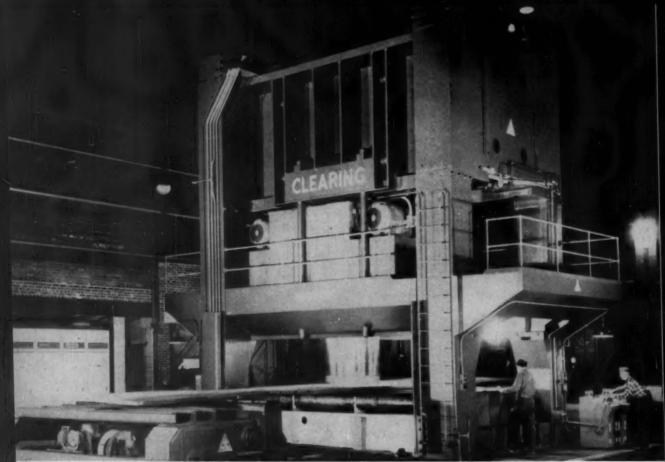


FIG. 1—Mammoth hydraulic straightening press has movable head, exerts full 5000 ton pressure

even in off-center loading positions. Pins incorporated in press bed raise or lower plate.

the press platen, permitting quick shifting of the plate to proper position under the ram for straightening. Forward of the feed cars are lift beams on the press, capable of lifting work clear of the lead car so it can be backed out, where long lengths are being handled, to take a new position on the plate. These also are pushbutton-controlled.

Welding such a heavy and bulky assembly naturally presented many problems. Clearing decided the only practical approach was to break it down into sub-assemblies. This allowed easier handling and proper positioning to permit downhand flat welds.

Seven main weldments were required. These included bed, uprights, crown, carriage, carriage support beams, feed cars and lift beams. Each of these, in turn, is made up of several sub-weldments, completed before being joined into the final shape. The 118-ton bed, for example, was built up of eight separate sub-assemblies of welded plate ranging from 1½ to 10¼ in. in thickness.

Largest main weldment is the bed. It measures 332-in. wide, 175-in. front to back and 110-in. in depth. Weight is 235,864 lb.

Essentially, the bed is made up of two  $10\frac{1}{4}$  in. transverse rails at the top and two 6 in. rails at the bottom. These are joined by  $4\frac{1}{2}$  in. webs to give an I-beam effect. The wide range of plate sizes in the assembly calls for careful attention to welding sequences to avoid distortion and cracking.

#### Backstep method used

A good example is the vertical 4½ in. web. This was welded to top and bottom rails by the backstep method. First pass was made with AWS E-6010 electrode. Several passes with E-7017 low-hydrogen electrode followed, to further ensure against the possibility of weld cracking. Finally, finish passes were made with E-6020. More than 12,000 lb of electrode was used on all weldments, the bulk being E-6020.

Plates were scarfed on both sides whenever possible to ensure joints with sufficient depth of weld. Fillets generally were built up to \(^{5}\sqrt{s}\) in. for added strength and neat appearance.

A novel kind of joint was developed for the main rails and webs of the bed. The  $4\frac{1}{2}$  in. webs were double-beveled at a 15° angle,  $\frac{5}{8}$  in. back at either edge. This left enough of a nose at the center to permit welding on a length of

### **Machine's Statistics**

Press stands 36-ft, 10-in. tall—27-ft 31/s-in. of this above floor level.

Dead weight: close to 600 tons.

Width between uprights, 210 in.

Bed measurements: 332 in. wide, 175 in.
front to back, 110 in. deep.

Four 20 in. diam tie rods 37 ft long tie crown and bed together.

Pressure exerted: 5000 tons.

### **Good Reasons For Welding**

Faster—eliminated need for patterns and castings, speeded delivery.

Cheaper for such a special job.

Produced optimum strength-to-weight ratio, by welding plates of varied thickness to develop strength where needed.

Allowed minor changes in design as work progressed.

Turned out clean, attractive unit.

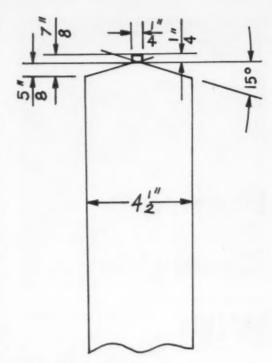


FIG. 2—Detail of doublebevel on 41/2 in. plate. Note 1/4 in. square bar welded to plate edge to form J-groove.

1/4 in. square bar to form what resembles a "J" groove. This without the need for costly handling and machining such a groove would otherwise entail. Details of this edge preparation is shown in Fig. 2.

The four uprights enclosing the tierods are box sections 179 in. long, and  $28\frac{1}{2}$  by 32 in. in size. They're built up of  $2\frac{1}{4}$  x  $3\frac{1}{2}$  in. plate, with single-vee welds along vertical joints. Various extensions and brackets are welded to them for carriage support beams and catwalks.

The backstep approach again was taken in making the long welds on the uprights. About 12 in. was welded full in the center of each side to start. The assembly then was turned repeatedly and welded full backstepping to the filled portion until finished. This tends to minimize shrinkage stresses and to balance them so as to avoid distortion.

The press crown closely resembles the bed. It measures 175 x 274 in., is also 110 in. deep. Normally, the crown is the main working member on Clearing presses. In this instance, though, it acts more as a supporting member, since the traveling carriage is the working member with reactions taken through crown, tierods.

The carriage is of unusual design. It's comprised of a 53-ton forged steel main hydraulic cylinder with 52¾ in. ID and 12 in. wall, to which are welded some 17 tons of plate sections varying from ½ to 2½ in. thickness.

Because the 53-ton cylinder is completely enclosed by relatively thin plate sections, the danger of crushing the lighter members while turning during welding had to be considered. So the design was broken down into three sub-assemblies. This simplified welding and permitted more men to work on the unit at one time.

The carriage travels on rails of the two support beams, which are attached to the uprights and crown. Top and bottom rails of the beams are 4 in. plates, welded to a 2 in. web with 1 in. ribs on either side for added strength. Tubing sections 37 in. long, with 6 in. OD and 3% in. ID are scarfed, welded and filleted in place to house the study used to attach the beam to the crown.

In joining the webs to the rails, the part was repeatedly turned from side to side for alternate welding, again to minimize distortion, warpage.

All weldments for the press were stress-relieved at 1175°F.

# Precision Assemble With Base Plate Method

- Watchmaking sets the pace for built-in accuracy on a regular conveyor-line basis . . . Applicable to the assembly of most precision instruments, the base plate method solves a variety of miniaturization design and production problems.
- Alignment, parallelism, hole location, and profiling are among the major items in the day-today business of turning out fine instruments . . .
   Base plate techniques bring economy and mass production to industry's most finicky assemblies.

◆ MAKING A PRECISION PART is one thing; getting it to move precisely in a precision mechanism is quite another. For overall accuracy, a moving mechanism must combine both. A well-made watch is a perfect example of this truism. But the fundamentals involved apply equally to the manufacture of thousands of metalworking products.

The watch industry recognized the critical importance of structural parts for mounting moving elements and, years ago, adopted the base plate method of construction. In line with this method, all rotating or moving parts are mounted on a single, precisely made "pillar" or base plate.

Smaller "sub" plates or "bridges" are used to keep in place the parts mounted on the base plate.

The industrial importance of the base plate method is no longer restricted to the watch industry. It is now applicable to a wide variety



Gear train of watch mounted on base plate will be held in place by sub plate being inserted.

of control instruments and precision mechanisms.

Along with the current demand for new precise, complex instruments for aircraft and guided missiles, there has evolved a need to make these mechanisms even smaller and more compact. The advanced base plate production methods developed by the Hamilton Watch Co., Lancaster, Pa., could provide the key to many miniaturization design and production problems. They are intended to promote greater miniaturization and easier mass production.

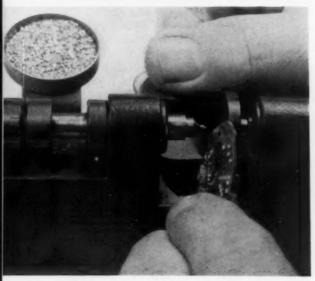
Watches are constructed with a sturdy base



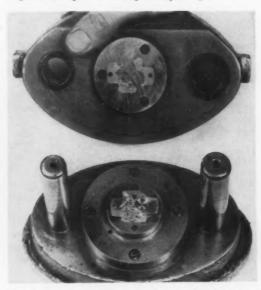
Accuracy of watch base allows operator to mount jewel bearings directly by push fit.



Automatic facing machine removes bumps and ridges resulting from drilling and spotting.



Only a push fit is required to mount dowel pins in watch base plate with speed and accuracy.



This shaving die is responsible for shaving 26 holes in train side of pillar plate.

plate on which the entire movement is assembled. Smaller sectional plates, parallel to the base plate, are used to permit easy assembly and hold all working parts in position. Accuracy of alignment of gears, escapements, and other interacting parts depends largely on getting accurate profiles and true parallelism in the pillar or other mounting plates. Hole dimensioning and location are equally important.

Hamilton's plate producing procedure begins with a blank diestamped from sheet stock. Blanks are machined to produce accurately

parallel faces. They are also punched successively with carbide shaving dies to provide the precise profile required. Later punchings with these dies enlarge holes to the desired diameter.

The carbide dies comprise a holder together with inserts. Use of these dies avoids dimensional distortion which can occur when steel dies are heat treated.

The die shaving operation has the advantage of producing many holes at once—all accurately sized and properly located. Even holes as small as 0.019 in. diam are produced by this



Delicate operation involves checking hole diameters in watch pillar plates with plug gage.

die shaving process. Striking proof of the precision in hole size achieved is the fact that jewel bearings can be set directly into the mounting plates without hand fitting or the use of special mountings.

Two other highlights of the production process are also responsible for the high precision of the base plates produced. These are: 1) the method used for dimensioning and locating, and 2) the inspection procedure used for quality control.

Instead of the conventional system of locating holes and recesses from finished surfaces, all dimensions are given from a single reference point (Z) in terms of distances along the two rectangular coordinate axes (X and Y). This eliminates pile up of machining errors due to accumulation of tolerances.

### Locate with tabs

Another important factor in eliminating errors in machining is the practice of making the base plate with attached tabs or lugs. Accurate holes in these tabs permit precision locating of the work for machining operations. When machining is completed, these tabs are removed.

A unique feature is that the locating tabs are outside the base plate itself. For this reason, if there is any inaccuracy present in the locating tabs, the error produced inside the plate is smaller. This principle helps substantially in holding machining operations to very close tolerances.

Almost every machining operation is imme-

diately followed by an inspection operation to insure that the job is done within tolerance limits. To check profiles, location of slots, recesses and holes, inspection is often done by optical projection.

Extensive use is also made of a Dixie machine or coordinate locater. This is a high-powered microscope through which the work-piece can be viewed while it is moved along either of the two coordinate axes by high precision, calibrated screws. Hole checking and similar operations are checked by go and no-go gages.

These plug gages are usually made of longwearing carbides. Gages are designed with the correct gage diameter over their entire length. They do not taper at the open end, as is the case with most conventional gages. The untapered end is intended to accurately check holes in thin plates. For an operation of this sort, a tapered-end gage would be more likely to give an unreliable indication.

Among other new developments, Hamilton has also come up with a special size and form of handle for plug gages. The new handles provide better "feel" in doing the gaging and reduce gage breakage.

All of these highlights of the mounting plate production process combine to produce a fully-assembled watch by the standard, conveyor-line procedures common in the automotive industry. Interchangeable parts arrive at proper points on the conveyor and are directly mounted on the pillar plate. Smaller mounting plates also make a contribution.

# Four Standard Grinders Make Automated Crankpin Line

• FOUR standard crankpin grinding machines are linked in an integrated line to step up production and improve quality in the precision grinding of V-8 crankshaft pins. The automatic setup eliminates manual loading and does not require that cycles be interrupted to index the shaft for each pin. It also incorporates automatic gaging of the workpiece during the grinding cycle as well as between stations.

The four grinding machines, products of the Landis Tool Co., Waynesboro, Pa., are synchronized mechanically, electrically and hydraulically. The same firm designed the loaders which move the crankshafts from one machine to another.

Basic cycle for each of the four machine units is one of pickup, grind, pickup and inspect. To start the full four-machine line, crankshafts are deposited on a conveyor at the left-hand end of the line. The loader picks up one shaft, lowers it between two chucks and swings out of the way.

The shaft is automatically checked for correct position between the chucks. When set, it is hydraulically clamped in this position and revolved so that the diameter and sidewalls of the first pin can be ground. In-process gaging stops the grinding action when a predetermined size is attained.

## Off-size work stops cycle

When the grinding wheel withdraws, the loaders again handle the crankshafts. Finished work from the first machine goes to a conveyor between the first and second grinder where it is automatically inspected for proper taper, width and diameter. Signal lights show any deviation from limits, and the preceding grinder will not operate until correction is made.

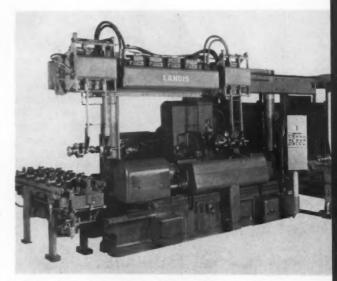
The grind-and-inspect cycle continues until the shaft has been processed in all four machines. All grinders and loaders are in continuous cycle so that four shafts are being handled at all times.

A quantity of shafts can be stored on the

conveyors between the grinding machines. However, a particular machine loader will not operate unless there is a shaft ready for loading as well as a vacant space on the next conveyor to accept a finished shaft.

If one machine must be shut down for wheel changing or regular maintenance, the other three grinders will continue to operate. Crankshafts are simply by-passed around the machine that is shut down. The missed operation can be done on a conventional hand-operated, stand-by grinder.

To prevent any damage, complete safety devices are built into the automatic system. Grinding wheels cannot move while loaders are in motion. Chucks cannot revolve until shafts are positioned and clamped, and the loader arms are retracted.

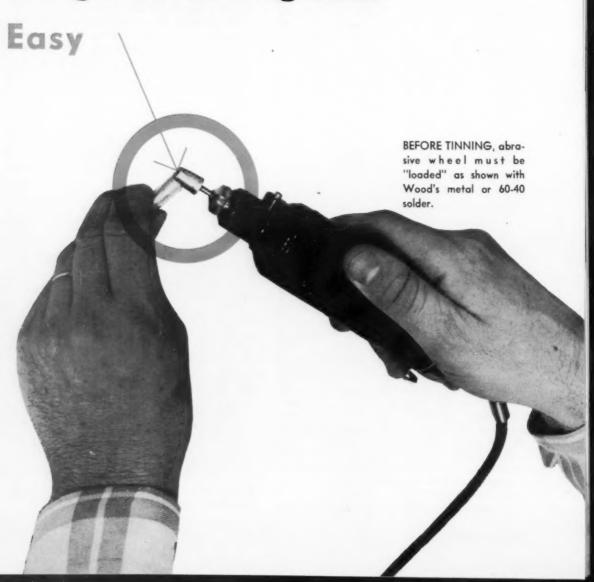


ONE of four grinders in production setup. It loads from bank at left, discharges at right.

# New Technique Makes

# **Tough Soldering Jobs**

- An abrasive wheel, some usual soldering materials, and you're ready to tackle some tough soldering jobs... With this new technique, materials such as aluminum, stainless steel, titanium, ceramics and glass can be soldered easily.
- ◆ Developed at Los Alamos Scientific Laboratory, the method abrades and tins surfaces otherwise difficult or impossible to solder.



♦ A SMALL GRINDER, plus the usual soldering equipment, is all that's necessary to solder materials otherwise considered difficult. Among these are titanium, aluminum, stainless steel, ceramics, glass and wood.

The new method uses an abrasive wheel to coat the materials with a layer of solder in a tinning operation. Actual soldering is then carried out in the usual manner.

Developed at the Los Alamos Scientific Laboratory, University of California, the process is expected to simplify small joining jobs in the aircraft and electronics industries.

It is carried on as follows: A hand grinder with an abrasive wheel is brought to bear on a soft solder such as Wood's metal or 60-40 lead-tin. Warming the grinder head first by operating it in contact with a piece of metal or by direct application of heat aids the process.

# "Conditioning" grinder important

Tinning alloy is applied to the grinder in bar form. Because of the warm grinder head and the heat of friction, the soft solder melts and coats the wheel.

One important consideration is to "condition" the new grinding head. It's a bit tricky, but once a good deposit builds up, it's easy to renew the layer after each tinning job.

At Los Alamos, a medium grit grinding wheel,  $\frac{1}{4}$  in. in diam and  $\frac{1}{2}$  in. long, mounted on a  $\frac{1}{8}$  in. diam shaft was used.

Once the deposit holds, the solder-loaded wheel is applied to the surface to be soldered until a slight amount of abrasion takes place. Then heat of friction again melts the solder, which flows onto the freshly abraded surface and forms contact.

By using a grinder incorporating variable speed, surface contact will slow down wheel. This indicates that optimum deposition has been reached since under greater hand pressure the grinder will stop entirely.

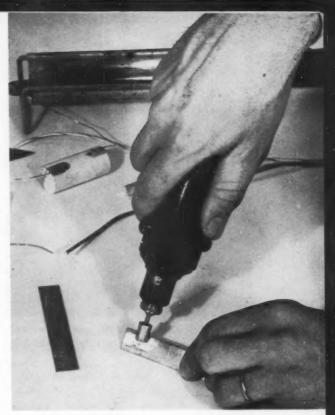
If possible, the work should be warmed, preferably to the melting temperature of the tinning alloy (about 176°F). Work may be heated with a hot soldering iron.

After the tinning operation, soldering is completed in the usual manner with standard 50-50 lead-tin solder.

The mating surface to be joined is also given this new tinning treatment if it's a material not easily wetted by solder. No soldering flux, surface cleaner or other pretreatment is used.

It's important, however, to keep the hot soldering iron from the subsurface layer of the base metal. This can be done by applying the hot iron at some adjacent part of the metal not tinned. Then apply the solder in wire form directly to the tinned surface.

Another method is applying the solder to the iron and bringing the hot drop of solder down to the tinned area without getting the iron into



TINNING of stainless steel takes place as "loaded" wheel abrades surface under light pressure.

actual contact with the base metal. This precaution is especially important when soldering titanium, niobium or tantalum.

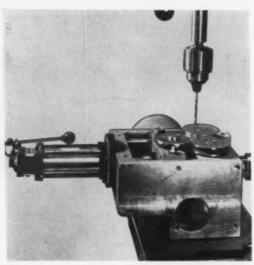
When working with such materials as soft glass, Pyrex and ceramics, the best tinning is accomplished with a mixture of Wood's metal and 50-50 indium-tin. Standard solders are not recommended for tinning on glass and ceramic materials.

When soldering glass to glass or ceramic to ceramic, it's necessary to use flame or furnace heating for heat on the surfaces to be joined. A soldering iron won't supply enough heat through a poor conductor to make a good glass-to-glass joint in large or thick pieces. With glass the new technique is most satisfactory for fastening electrical connections and for similar light work.

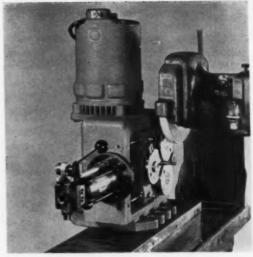
Many alloys melting at 104°F to 284°F were used in the tinning operation with success. Solders applied included 40-60 and 50-50 lead-tin, 50-50 tin-indium and 50-50 lead-indium.

The 50-50 tin-indium adhered very easily to Pyres glass without the usual degreasing and heating cycles. Once applied, it took the higher melting solders for a firm joint.

When depositing Wood's metal on glass an unusable coating will result if the wheel is too cold when loaded. High wheel speed will also mean a coating to which solder won't adhere.



CLOVERLEAF-TYPE BEARINGS spin rod at high rpm, provide absolute concentricity for deep hole drilling.



SURFACE GRINDER shapes secondary diameter accurately concentric within 0.00001 in. FIR.

Up to 500,000 rpm-

# New Bearings Convert Old Machines To Ultraspeeds

- Now you can take fuller advantage of the cutting potential in carbides and ceramic tools without costly investment in equipment... With simple (and reversible) conversion, attain speeds up to one-half million rpm.
- No special lubricants, gear trains or provision for extreme machine rigidity are required . . .
   Even with a 70,000 rpm grinding head, power shaft spins at 3600 rpm or less . . . Lower speeds too, for milling, broaching and boring.

By J. F. KOPCZYNSKI, President, St. Mary Mfg. Co., North Tonawanda, N. Y. ♦ NOW YOU CAN boost spindle speeds on your machine tools to 500,000 rpm without heavy equipment investment. Intermeshing contact roll bearing assemblies solve the problems. They already provide real insight into machine speeds, feed rates and depth of cuts in the 40,000 to 100,000 rpm range.

The new cloverleaf-type designs avoid slippage, yet involve no gear trains. Special lubricants and provision for extreme machine rigidity are similarly eliminated, even with spindles revolving at a full one-half million rpm.

Standard 3600 rpm electric motors coupled to contact roll bearings drive spindles at speeds beyond 70,000 rpm. Previous efforts to maintain such speeds in shops proved costly.

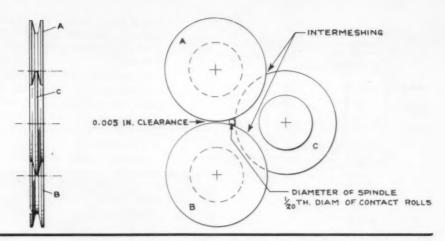


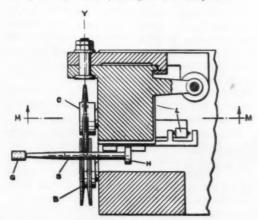
FIG. I—Spindle between contact roll bearings spins up to 500,000 rpm without special lubricant.

The improved cloverleaf-type bearing was pioneered by St. Mary Mfg. Co., North Tonawanda, N. Y. The term "cloverleaf" distinguishes these bearings from other contact roll bearings.

The bearing problem alone often discourages speeds beyond 30,000 rpm on spindles  $\frac{1}{2}$  in. diam and more. One bearing maker puts it thusly, "If bore diameter in millimeters times spindle rpm exceeds 300,000, you've gotten into special bearings."

Under such circumstances, design and production troubles multiply to include, 1) extraordinarily close runouts, 2) associated tight tolerances, 3) special purpose lubricants, as well as 4) costly gaging to assure manufacturing accuracy. All these conspire to plague the bearing maker in his efforts to build superspeed bearings. The same difficulties also promise high initial cost, excessive maintenance re-

FIG. 2—Internal grinding head oscillates accurately, slowly, while spinning at 50,000 rpm.



quirements, and shorter-than-normal bearing life.

Even a short time ago, grinders operating at 100,000 rpm cost more than 15 times those built for 40,000 rpm duty. One metalworker found that increasing grinding speed to this extent boosted his basic equipment costs from roughly \$500 to \$8,000.

## **Cut machining costs**

Despite these handicaps and others, metalworkers continue to press toward higher machine speeds. Current interest in superalloys and other tough-to-machine materials is only part of the picture.

Higher speeds possible with cloverleaf-type bearings help materialize some of the many benefits implicit in the carbide and ceramic cutting materials. Metalworking opinion on the frangible nature of such materials assumes less importance with cloverleaf bearings. Shock loading due in part to lack of machine rigidity is largely avoided. This advantage shows up in longer tool life.

In cutting or grinding, benefits in higher speeds include less machine time, fewer man hours, and more production. Preloading spindles to pressures well beyond those allowable in conventional bearings encourages better surface finishes in less time. Production efficiency in some shop situations has climbed more than 50 pct above standards, traceable almost entirely to installation of cloverleaftype bearings.

One actual shop finishing operation typifies this. Previously, rough and finish grinding of  $\frac{3}{8}$  in. ID bushings required both a rough and finish operation at conventional speeds. A shift to cloverleaf-type bearings brought about speeds of 225,000 rpm on a  $\frac{1}{4}$ -in. spindle. This plus a carbide burr halved grinding time, and

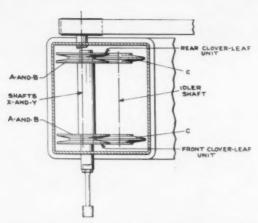


FIG. 3—Coupled cloverleaf-type bearings assure absolutely level grinding action on any surface.

substantially increased over-all efficiency of the operation.

In another example, a Buffalo metalworker found himself with 4-hr carbide tool life on a new machining operation. Trouble lay in turning the material: cold rolled AISI 4130 steel bar stock up to 20 ft long, and from 1 to 5 in. diam. Replacement of the carbide tip at four hour intervals boosted machine downtime fantastically. Setup time also slashed deeply into potential job profits.

Preliminary checks indicate that speeding the operation to 100,000 rpm will shorten machining time measurably. Longer tool life can be anticipated too. Maintenance factor remains almost unchanged, but setup costs should plummet.

Limitations do exist both in the bearing design and its applications. But they are few and generally obvious. On the other hand, the list of positive factors lengthens daily. Many of these advantages can apply in your own shop.

# Eliminate drill breakage

Drill center holes almost any diameter and depth with the aid of preloaded cloverleaf-type bearings. Dead center hole location results time after time, even on some of the older and presumably worn drill presses. Regardless of hole diameter, drill breakage due to hole eccentricity vanishes. This applies even to those experimental holes so small they've yet to establish real production applications.

Grind diameters accurately too, concentric within ±0.00001 in. If this claim bothers you, check the results. Full indicator readings in relation to part axis or another diameter fall below the measuring accuracy of most FIR instruments.

Oscillating grinders also benefit from contact roll bearings. At 50,000 rpm, grinder

heads move slowly and smoothly over rough surfaces. Grinder spindle remains accurately level at all times within almost immeasurable tolerances.

Cloverleaf-type bearings employ three intermeshing contact rolls (Fig. 1). Wheels normally are machined to the same diameter from heat treated, high carbon, high chromium steel. They ride on commercially available precision ball bearings.

Grooves extend completely around the periphery of two rolls, A and B in Fig. 1. A flanged third roll matches the grooves in the other two. In operation, the flanged roll overlaps the grooved rolls, creating an intermeshing action.

# Speeds to 500,000 rpm

The intermeshing principle permits varying speed ratios from 1:1 through 20:1. By driving contact rolls with a commercially available 25,000 rpm pneumatic or electric motor, spindle speeds up to 500,000 rpm are readily attained.

Contrary to what might be expected, intermeshed rolls do not slip. Extensive shop experience verifies and reverifies this point. Special ultraspeed lubricants are not needed, for no point requiring lubrication turns faster than 25,000 rpm. Intermeshing rolls also evade the need for stepup gear trains, and all the troubles they meet at high speeds.

In one class of application, contact roll bearings generate back and forth motion of a grinding head while the spindle itself continues rotation. In Fig. 2, contact roll C pivots on fulcrum Y. Controlled oscillation results between stops. Limit switch L reverses pivot action. Internal grinder head G and shaft H revolve continuously during oscillation at 50,000 rpm, yet remain level.

In standard internal grinders, the entire workpiece table oscillates, requiring a high degree of machine rigidity. Contact roll design differs radically in that only the spindle oscillates. Necessary rigidity is supplied directly by the cloverleaf bearings themselves.

In the past, machine tool builders rightly insisted higher speeds must include provision for extreme machine rigidity. Contact rolls largely elude that requirement. Coupling two low speed bearing assemblies in parallel provides three point spindle support at two planes along its length (Fig. 3). Preloading the wheels results in automatic adjustment, compensating for any wear.

The self centering character of the spindle virtually eliminates high speed vibration. Contact rolls and the power source rotate and vibrate within ranges controllable by conventional means. In all installations to date, bolting the machine to the shop floor proved unnecessary.



Propagating garden tools and laborsaving equipment constitutes another of the many industries who regularly buy Newport Steel products. By delivering steel in specified qualities and quantities to meet the most discriminating needs of these manufacturers, Newport helps provide dependable service in the finished product. With over seventy years' steelmaking experience, plus modern facilities, strategic location and conscientious personnel, Newport Steel is indeed a most logical source of supply. Look over the list of products below and talk to Newport before you buy.

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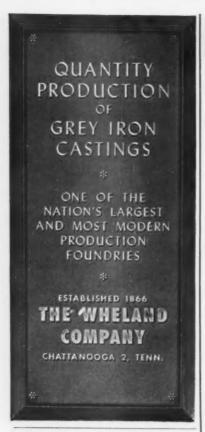
Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads, and 143 motor carriers enable Newport to give economical, dep area of the Middle West and South.



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# Digest of the Week in Metalworking

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# **New Technical Literature:**

Catalogs and Bulletins

# Surface grinder

Three-color, eight-page catalog gives a description of this firm's hand-feed precision surface grinder. The illustrated catalog shows how the unit grinds big tool room jobs, grinding flatly and accurately deep every time. Design features are fully described as are such attachments as new Electrabrasive stepless, variable speed spindle, a filterless dust exhauster and wet grinding attachment. Abrasive Machine Tool Co.

For free copy circle No. 1 on postcard, p. 113

# Slide valve

Data Sheet Ub describes a company's line of universal slide valves, designed especially for use in pipeline transporting solid materials in liquids. The 4-page sheet discusses a design of slide valve which provides straight through flow in the open position with full pipe diameter. Details of construction are covered in text and illustrated, together with operating mechanisms for manual or power operation. Line diagrams with dimension tables give pertinent size data for various models. Allen-Sherman-Hoff Co.

For free copy circle No. 2 on postcard, p. 113

# Spot, projection welders

Bulletin 335-1 describes a firm's spot welder and their projection welder. Both of these machines are air operated, press type, patented three-phase, and are designed to cover a wide range of commercial welding applications. The brochure contains dimensional drawings and illustrations. The tooling required to convert the second unit from projection to spot welding is also shown. Machine data is tabulated to indicate kva range, throat depths, welding capacities and electrode forces. Sciaky Bros., Inc.

For free copy circle No. 3 on postcard, p. 113

# FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 113.

# **Roll forming machines**

Bulletin 77 describes a line of slip roll forming machines equipped for rapid forming of obround and rectangular shapes. Both power and hand operated models are mentioned as available with this optional feature. The bulletin also includes an explanation of the factors governing the selection and operation of slip roll formers and a full description of the firm's standard line of slip roll forming machines for cylindrical work. Operating features and specifications of the line are covered. Another section discusses optional features. Niagara Machine & Tool Works.

For free copy circle No. 4 on postcard, p. 113

# Welding repairing

Welding repairs and fabrication are detailed in a new, 4-page booklet which outlines the various welding processes used for making repairs to broken or worn machinery, as well as structural repairs to railroad bridges, storage tanks, material handling equipment. Other subjects covered are repairs to twisted crane booms, hot strip rolls, pinions and machine frames; ship repairs to stern posts, rudder frames, shafts and propeller struts; boiler repairs, retubing, patching, turbining and building up corroded surfaces. Special fabrications from rolled steel plates or slabs for constructing tanks and other types of weldments are also outlined. Metalweld, Inc. For free copy circle No. 5 on postcard, p. 113

# Welding processes

A new 16-page "Picture Book Of Facts on Eutectic's Welding Processes" is available giving information on the "Low Heat Input" metal-joining process. The booklet describes how the process combines the advantages of the low application heats of brazing with the greater strength of fusion welding. Eutectic Welding Alloys Corp.

For free copy circle No. 6 on postcard, p. 113

# Beryllium copper springs

Four-page technical bulletin describes the use and advantages of beryllium copper as the heart of a new vibration damping device for mounting electronic components in aircraft. This case study covers damping units manufactured by the K. W. Johnson Co., Dayton, Ohio. Included in the bulletin are complete data on metal requirements for the alloy wire mesh springs, as well as design and fabrication considerations. Beryllium Corp.

For free copy circle No. 7 on postcard, p. 113

# Boiler feed pumps

Boiler feed pump information for 2-stage centrifugal types is covered in a new bulletin. Described are the firm's types UNB and UB-12 with capacities to 2500 gpm and heads to 900 ft. Major features of the pumps, which are expressly designed for industrial and institutional power plant service, are described. Worthington Corp.

For free copy circle No. 8 on postcard, p. 113

# **Punch problems**

"Fifty-five Perforating Problems and Their Solutions" is the title of a 20-page booklet. Illustrations of actual parts provided by punches, including many examples where stock thickness exceed punch diameters are shown. In addition there is a description of the problem involved in each case, the solution, actual production facts and costs. Many types of perforating problems, involving various types of metals and thicknesses from 0.025 to 1.250 are included. Pivot Punch and Die Corp.

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# KEYSTONE WIRE for Industry

## FREE TECHNICAL LITERATURE

# Type 430 steel sheet

A 16-page illustrated booklet describes the physical properties and analysis, relative corrosion resistance, fabrication, application and care of Type 430 nickel-free stainless steel sheet. Washington Steel Corp.

For free copy circle No. 10 on postcard, p. 113

## Oil controls

Illustrated 4-page circular describes a line of constant level oil controls; bottle oilers for plain bearing lubrication; glass body oil cups; and aluminum body oil cups. The circular includes detailed dimensions and installation instructions covering a wide range of applications. Lunkenheimer Co.

For free copy circle No. 11 on postcard, p. 113

# Magnetic materials

"Magnetic Materials" gives numerous colored diagrams and graphic illustrations on magnetic materials. Also included is information on types of magnetic core materials, eddy currents, silicon steels, oriented silicon steels, permanent magnet materials, and an application chart for magnetic core materials. Allegheny Ludlum Steel Corp.

# Nickel-clad copper wire

For free copy circle No. 12 on postcard, p. 113

New technical bulletin, T-3, which presents engineering and application information on nickel-clad copper wire is available. Also included in the bulletin are data on the electrical characteristics of the material. Alloy Metal Wire Div., H. K. Porter Co., Inc.

For free copy circle No. 13 on postcard, p. 113

# **Tubing alloys**

New folder, it is stated, will interest engineers and others involved with the design or maintenance of processing equipment requiring the use of tubular products at high temperatures. This 6-page folder, known as TDC-163A, furnishes information on analysis, mechanical and physical properties and creep and rupture data on various tubing alloys in elevated temperature service. Tubular Products Div. of Babcock & Wilcox Co.

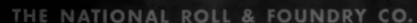
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# How to Keep Your Production in

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Whether you are forming angles, rails or beams, bars or rounds, or any other shapes, National can supply the rolls that will stand up in your stands for longer tonnage life... rolls that are soundly cast and precision machined with accurately cut roll passes. To keep your production down time to a minimum, specify durable National rolls; they will more than meet your expectations.



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Specialists in Iron, Alloy Iron and Steel Rolls, Carbon, Alloy and Manganese Steel Castings

# FAMOUS FIRSTS IN THE IRON & STEEL INDUSTRY



During the War for Independence, the iron industry expanded greatly because of the increased demand for cannons, cannon balls and other war materials. However, one of the most interesting and outstanding contributions towards the cause was a chain that stopped the British Navy from going up the Hudson River beyond the Fort at West Point.

In 1778, the Sterling Works, some 25 miles southwest of West Point, operated all their forges day and night to make a massive chain 1500 feet long. Each link was 2 feet long and weighed 100 pounds. This chain was carried to West Point, floated on

logs and stretched across the Hudson, where it made a formidable barrier no British gun boat dared to cross.

BAKER'S MAGDOLITE, the original deadburned dolomite makes an important contribution to steel producers. MAGDOLITE offers you more uniform ingots, and better furnace efficiency at lower refractory costs. BAKER'S MAGDOLITE is always 5 ways better: Composition, Preparation, Strength, Economy and Quality, so the next time you order dead-burned dolomite, specify BAKER'S MAGDOLITE.

4-55

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The original dead-burned dolomite

# THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA · PLANTS: BILLMEYER, YORK, PENNSYLVANIA · MILLERSVILLE, OHIO

# FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 108

# Company profile

Illustrated, 32-page booklet details a firm's process and service facilities. Described with words and pictures are plate processing, making toothed wheels and gears, pinions and arbors, screws and springs, shaped parts, investment castings, watch and clock dials and hands. Space is given to operations such as die making, heat treating, electroplating, as well as inspection, laboratory and research facilities. Hamilton Watch Co.

For free copy circle No. 15 on postcard

# Construction equipment

Sixteen-page brochure describes a line of equipment including crawler tractors, bulldozers, side booms, tractor shovels, motor scrapers and wagons, motor graders and pull scrapers. Also included are power units and all-purpose wheel tracfeatures tors. Operating and specifications are included for the various types and models of the line. Allis-Chalmers Mfg. Co.

For free copy circle No. 16 on postcard

# Sliding bed lathes

A 2-page bulletin describes 32 in. x 100 in. and 32 in. x 125 in. sliding bed gap lathes. The lathes, which can be pit or platform mounted, are designed for turning parts such as knee joints, shafts with large disks and similar odd-shaped parts with extreme projections from the lathe center line. Complete dimensions, specifications and a list of special attachments are presented in the bulletin. In addition there are application photographs of the machines turning landing gear struts and large matched metal molds. Axelson Mfg. Co., Div. of U.S. Industries, Inc.

For free copy circle No. 17 on postcard

# **Electric tools**

A new universal electric tool catalog contains information of this manufacturer's line of electric tools for use in the automotive, industrial, construction, maintenance, trade crafts and home workshop fields. Specifications and information are given on a number of tools the firm has introduced during the past six months. Thor Power Tool Co.

For free copy circle No. 18 on postcard

# Rubber products

Handbook No. 525, described as the newest in the "O" ring and custom molding industry, contains charts, illustrations, graphs and engineering data in the development of the "O" ring seal design. Included is information on internal and external grooves, gland finishes, chamfers, selection of gland, piston rod, and cylinder materials. Plastic and Rubber Products Co.

For free copy circle No. 19 on postcard

## Stainless steel tube

Technical points to be considered when purchasing or specifying welded stainless steel tubing are detailed and illustrated in a new 12-page brochure on stainless steel heat exchanger and condenser tubes. Set forth in photograph and text are such topics as process, manufacture, chemical composition and analysis. The brochure shows stainless steel tubes as they are made to conform, and in some cases, exceed all conditions and requirements of ASTM Specifications A-249 and A-269. These apply to welded Austenitic stainless steel heat exchanger and condenser tubes. Steel and Tubes Div., Republic Steel Corp.

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# **Cutting machines**

Two cutters—a portable flame cutting machine and a portable shape cutting machine—are described in a new folder. Operation and construction features as well as accessory equipment is included. The shape cutter is described as a versatile tool with which smooth cuts and production tolerances can be held to  $\pm 1/64$  in. The flame cutting unit is designed for cutting straight lines, square and bevel kerfs and circles. Victor Equipment Co.

For free copy circle No. 21 on postcard

# **Jointings**

Line of compressed asbestos jointing, composed of asbestos and rubber, is described in a booklet prepared for a British manufacturer. The material is available in various types such as universal jointing, wire-reinforced jointing and acid-resisting compressed asbestos jointing. Graphs giving compressibility data as well as recommended grades of jointings for different chemicals are included in the book. Richard Klinger, Ltd.

For free copy circle No. 22 on postcard

# Corrugated containers

Six case history applications about heavy - duty corrugated containers are illustrated in a new 4-page brochure. Specific examples of benefits and savings which have resulted from the use of this product are shown. Products covered include major appliances, bulk chemicals, grinding wheels, rubber hose, and textile yarns. Gaylord Container Corp., Div. of Crown Zellerbach Corp.

For free copy circle No. 23 on postcard

# Force gage

A mechanical force gage for precision measurement of pressure, tensile or torque is described in a new pamphlet. An illustrated 3-page spread details the type of jobs this unit will complete. In addition, another section of the literature describes variations of the gage which can be obtained for special problems. Line diagrams of standard models and dimensions are included. W. C. Dillon & Co., Inc.

For free copy circle No. 24 on postcard

# Press controls

Filustrated 12-page catalog shows controls specifically engineered to provide better operation of presses and press accessories, automatic feed devices, and scrap cutters. The book explains, it is stated, that such controls can provide better efficiency, flexibility and safety to presses, dies, and operators. Among the features and characteristics of the controls described are a single main control enclosure for simplified maintenance or adjustment of controls, built in electric power and air pressure outlets, fingertip master control panel, pre-testing of all control circuits before delivery and parting line mounting of terminal boxes to simplify press installation. Danly Machine Specialties, Inc.

For free copy circle No. 25 on postcard

# Teflon packing

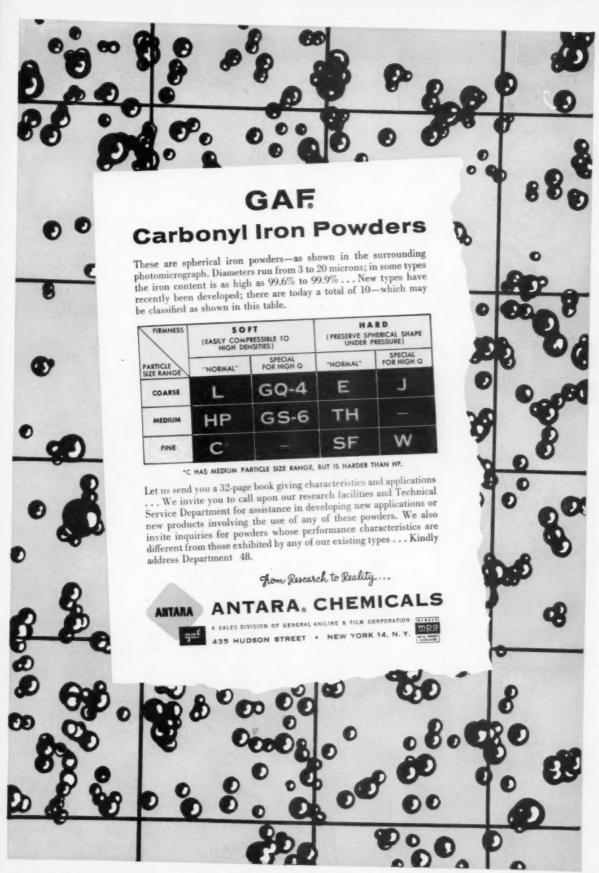
Wide variety of packings and gaskets made of Teflon are described in an 8-page bulletin. Illustrated and detailed are split and folded types of envelope, gaskets, solid gaskets and Teflon stuffing box, vee-flex, braided, plastic and various types of valve stem packings. Complete service recommendations for each type packing are included as well as sizes. The bulletin also includes information on the properties of Teflon. Raybestos-Manhattan, Inc.

For free copy circle No. 26 on postcard

# Het anhydride

Het Anhydride is the subject of Bulletin No. 43 now available. The 17-page new bulletin describes general properties, typical reactions and suggested uses for this chemical now available in substantial semi-commercial quantities. It defines Het Anhydride's properties as a hardener or curing agent for liquid epoxy resins with respect to strength and stiffness at high temperatures, fire resistance, high heat distortion temperatures, and excellent mechanical and physical properties. Some major fields of applications are outlined where Het Anhydride's properties, not obtainable together heretofore, can be utilized. Hooker Electrochemical Co.

For free copy circle No. 27 on postcard





# "Airco 312 Electrodes are my choice for hard-to-weld steels"

The Airco 312 is an all-position mild steel electrode designed to produce weld metal possessing not only excellent mechanical properties but also low hydrogen content. The arc action is relatively quiet, resulting in low spatter. The molten steel is not turbulent. For welding steels when the exact composition is not known.

This is but one of many electrodes in Airco's complete line that also includes stainless steel, hard-facing, cast iron, general and special purpose electrodes. Send for the free Airco Electrode Guide which will help you select the right electrode for your specific job. Request catalog



# **MACHINING: Electrode Eroding**

Providing four working speeds, roughing, semi-finishing, finishing and micro-finishing, new tool uses electrode erosion . . . Cited as shaping any hard material which is a conductor.

A new machining tool, using the principle of electrode erosion, is cited as shaping any material no matter how hard as long as it is an electrical conductor.

Developed by Abaco Industries, Inc., Elmhurst, N. Y., the unit is described as simplifying machining operations, especially in jobs such as forgings dies and aircraft parts.

This machine works by reproducing directly the shape and profile of a soft master electrode in an already hardened alloy or carbide piece. It strikes a series of sparks between the tip of the tool and the harder block. In this way it directly machines the metal by direct action of electricity, and at no time does the electrode ever come in contact with the piece it is machining.

The unit is described as capable of removing 3 in sq of material an hour, on a surface as big as 50





Electrode finish machined die in under 2 hrs. at  $\pm 0.0005$  in.

## WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

cu in. or more, or as small as a few thousandths, giving a 10 micro finish and holding tolerances of 0.0005 in.

## **High Frequency Generator Used**

It is composed of a high frequency generator and a conventional machine which has the appearance of a vertical jig borer. This high frequency generator is 5 ft high by 3 ft long by 2 ft wide and is entirely electronic. It consists of a rotary high frequency generator, a battery of rectifiers changing the current into pulsating dc and a charging battery of capacitor for high energy storage.

The machine has 4 working speeds: roughing, semi-finishing, finishing and micro-finish, all with the turn of a button. Settings can be regulated from very low to very high intensity by turning another dial.

It has a special circuit permitting a very sharp spark discharge. The machining head has a nonrotating quill moved up and down by a servo-motor. The working tool is under the constant action of this servo to give it complete automation for the execution of high precision work. An electronic feeler controls a sensitive servo mechanism that moves the tool to hold a pre-set gap at all times, and compensates for tool erosion.

# Methods:

# Electronic meter traces out industrial noise

A new electronic instrument to aid the fight against one of the country's most troublesome safety problems—industrial noise—was introduced recently by the Mine Safety Appliances Co., Pittsburgh.

The instrument is described as the first that combines in a single, portable unit four principal functions necessary to measure and analyze noise accurately. Acoustical engineers, industrial hygienists, safety directors, industrial designers, audiologists, city planners, speech experts and many others concerned with the problem can use the instrument to track down hazardous noises.

## Measures Sound Levels

Called the "Soundscope," the instrument serves as a meter to measure overall sound levels. It also operates as an analyzer, measuring sound in each of eight octave bands to determine noise peaks. In addition, it can check

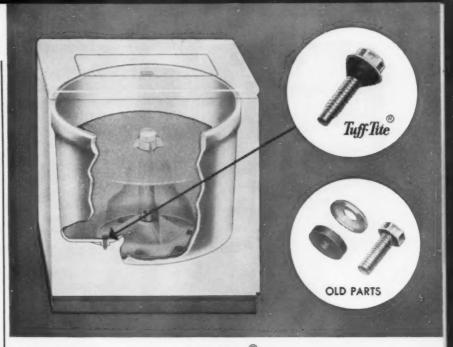


Taking sound pressure level readings at a punch press.

sounds in narrower frequency bands. Electrical and acoustical calibrators are built into the unit.

The 20 pound instrument takes the place of four individual units previously required for noise analysis. It is expected to play an important part in efforts to control noise, which the American Standards Association reports has resulted in \$2 billion worth of claims being filed against industry.

Because the instrument is port-



# Townsend Tuff-Tite Fastener Gives Leakproof Fastening... Protects Enamel On Washer Tub

A large manufacturer of domestic washing machines has found the solution to leakproof fastening of tub to frame with Townsend Tuff-Tite fasteners. Previously, a three-piece fastener had been used—bolt, metal washer and flat neo-prene washer.

Now, the one-piece Tuff-Tite brass bolt and washer with the conical assembled neoprene washer shown above is doing the job.

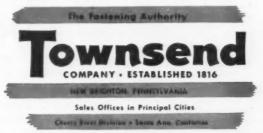
The result—positive leakproof assembly—superior protection from chipping the porcelain enamel—greater resistance to loosening from vibration. Assembly has been speeded and triple inventory eliminated.

This achievement is made pos-

sible by the design of all Tuff-Tite fasteners. They have an undercut in the washer head which controls and traps the neoprene when the fastener is tightened. The neoprene is forced into the hole and around the threads to provide a cushion which protects the surface and forms a water-tight and airtight seal.

Tuff-Tite fasteners are available with many types of screw and bolt shanks and head styles. They are made of carbon, alloy, and stainless steel, aluminum, brass and other metals.

To learn more about how Tuff-Tite can give you leakproof surface protection with economy, use the coupon below.



In Canada: Parmenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario

TOWNSEND COMPANY Post Office Box 237B New Brighton, Pa.

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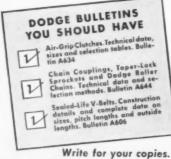
AIR-GRIP CLUTCHES



CHAIN COUPLINGS



SEALED-LIFE V-BELTS



DODGE MANUFACTURING CORPORATION 800 Union Street • Mishawaka, Indiana



able, self-contained, simple to operate and incorporates necessary analytical features, its widest use will be in the field of industrial noise prevention to combat occupational loss of hearing.

## Damage Suits Cited

During a conference held in connection with the introduction of the Soundscope, Dr. Leo G. Doerfler, professor of audiology at the University of Pittsburgh School of Medicine, branded industrial noise as a "public problem." Although millions of dollars in damage suits for occupational loss of hearing are the direct concern of industry, the public eventually will share the cost, he said.

Another noise control expert, Kenneth C. Stewart, research associate at the University of Pittsburgh's Graduate School of Public Health, pointed out that the loudest noises do not necessarily cause the most damage. The frequency of sound—number of sound wave vibrations each second—must be measured along with intensity, or loudness, to determine the degree of hazard.

Overall noise level measurements, Mr. Stewart said, provide little indication of what specific frequencies are causing the problem. A single industrial machine, he said, can produce sounds of many different frequencies with widely varying intensities. Each frequency band must be studied individually to locate the potentially harmful noise source so corrective action can be taken.

# Fabricating:

# Bridge strand-anchor rods will support hanger roof

The large universal testing machine at Lehigh University has been used to test specimens of galvanized bridge strand and steel anchor rods. The units tested will support a large TWA hangar roof at Philadelphia Airport in place of the customary ceiling beams or trusses.

Twenty sections of the 2 9/16 in. strand, totaling 3060 ft in length, will be used to support the lean-to style roof. The strand, in turn, will be supported in pairs by ten 28-ft-high steel tower posts set near the outboard edge of the roof. The strand will ride on a saddle set on the top of each post.

The strand was made at the Williamsport plant of Bethlehem Steel Co. Steel sleeve sockets, which fasten the strand to 40 anchor rods, were specially made for this use.

### Withstand 98,000-lb Load

The threaded 4 in. diameter rods, ranging in length from 11 to 32 ft, are alloy steel quenched,



Strand assembly for roof support is tested at 784,000 lb.

tempered, and extensometer tested. Rolled and heat treated at Bethlehem and threaded at the Lebanon plant, they are designed to withstand a 980,000-lb load. That the rods are capable of surpassing this requirement was indicated when one of the lot was pulled apart at 1,552,000 lb in a tensile test at Lehigh.

Also, an assembly consisting of a length of strand, socket, and anchor rod was tested to a required 784,000 lb of ultimate strength. In the hangar structure, one end of the rods, together with washer and nut of the same material, will be embedded in concrete so as to anchor the strand. The hangar will be fabricated and erected by Lehigh Structural Steel Company.





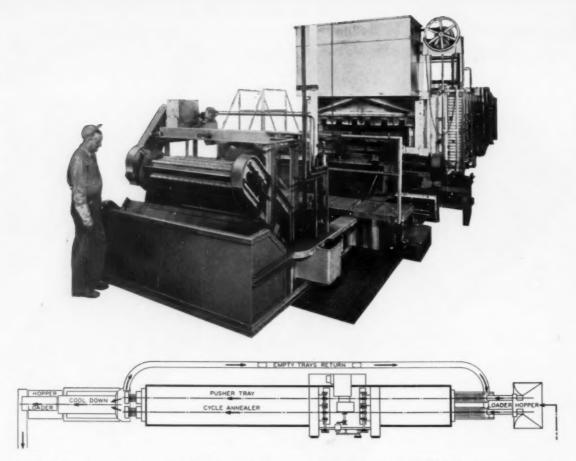
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This 'Surface' automatic cycle annealer operates at the rate of 2,000 lbs/hr, isothermally annealing forgings of SAE 8717H, 1117, and 1137 steels.

# Automatic cycle annealing repays Marion Division 4 ways

(1) Faster production, (2) product uniformity, (3) reduced machining time, and (4) reduced handling have more than repaid the Dana Corporation, Marion Division, since they installed 'Surface' automatic cycle annealing equipment.

Their cycle of heating-soaking-fast-cool-holding-fast-cool is about twice as fast as conventional annealing. At the same time, it provides exceptional control of metal structure, and results in better machinability. Furnace mechanization precisely regulates work time in each zone of the cycle, and can be varied to suit the steel.

Automatic loading and unloading provide smooth, straight-through operation and cut handling costs. Why not ask 'Surface' to help you apply these advantages to your own annealing operations?

Send for Bulletin SC-146, Surface Combustion Corp., 2373 Dorr St., Toledo 1, Ohio



SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

Also makers of Janitrol® automatic space heating and Kathabar® humidity conditioning units

# Coating:

No peel, crack or chip cited for new finish

Development of a chemical product that can give permanent protection against most enemies of metal surfaces on everything from battle ship hulls to silverware has been announced.

A single application of the material by the new process bonds it to metal surfaces in a thin, transparent layer, the maker, PSC, Inc., says. This coating preserves the metal's natural brilliance and prevents tarnish, oxidation, corrosion and stains on silverplate, chrome, steel, aluminum and other ferrous and non-ferrous metals.

### Abrasives Won't Mar It

The finish will not peel, crack or chip, according to the inventor, even when stamped or hammered in the intermediate stages of manufacturing metal products. Soft abrasives and frequent washing and handling cannot mar it. It is described as highly heat resistant, and its ductility is greater than that of many metals.

PSC also claims its product is chemically inert to most saline solutions, including ordinary salt water and industrial brines, dilute acids, many strong alkalis, organic solvents, foodstuffs, beverages, humidity, gases normally in air and many sulphur compounds. Once bonded to a metal, it is nontoxic.

The new product can be used on plated, anodized or plain surfaces and on metals containing organic dyes or inorganic dye coatings, according to PSC. Any shape or form of metal, plain, embossed or etched from wire to sheet, can be treated by its process, the firm reported.

Cost of making the product commercially is described as "reasonable and practical," and the processing can be done by many companies "mostly by adapting equipment they now have."

PSC takes its name from the initials of its product's claimed characteristics, "Permanent Single Coatings."

# Diecasting:

Double chamber furnace betters metal melting

Teams of die casting machines and furnaces have solved many problems of high production with controlled quality for a manufacturer of aluminum and zinc die castings.

Every die caster at Madison Kipp Corp., Madison, Wis. must melt and hold alloys under proper conditions at a rate which allows maximum output of the die casting



Furnace side dipout is located close to diecasting machine.

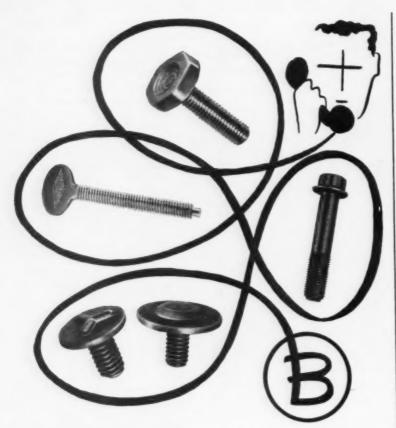
machines. Every precaution must be taken to prevent gassing of the molten metal and inclusions of oxide, moisture, and oil. Porosity and sub-standard castings are the direct result of the presence of impurities in the metal. After many experiments, Madison-Kipp has decided that dry hearth doublechamber aluminum melting furnaces, teamed with their die casting machines, offer the most practical solution to metal melting problems.

A number of these furnaces have been supplied to Madison-Kipp by Eclipse Fuel Eng. Co., Rockford, Ill.

Development of the doublechamber dry hearth furnace is described as an evolution from the crucible or pot furnace. It has evolved to a single unit which contains one chamber for melting aluminum and another chamber for holding the molten bath ready for

Aluminum is charged through the air-operated door onto a sloping





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hearth, where it is melted, prior to entering the holding bath. This arrangement prevents cold metal from entering the hot bath to reduce the temperature below the point of good casting. These furnaces are arranged with one burner or set of burners for melting the aluminum, and another burner for holding melted metal at correct temperature for dipout. The burners in the melting chamber fire down at the aluminum in order to engulf it completely, without overheating.

## **Advantages Listed**

Moisture is released from the metal before it melts and flows down to the holding bath. This eliminates any possibility of gassing the metal, thus preventing porosity. The melting arrangement drives off lubricants or other impurities, which might be included in gates and risers charged into the furnace for remelt. Other advantages of the furnace are reported as easy loading, minimum heat at dipout, accurate temperature control, no stirring of the metal, a hearth that is easily cleaned, and an over-all design which requires very little maintenance.

# Machining:

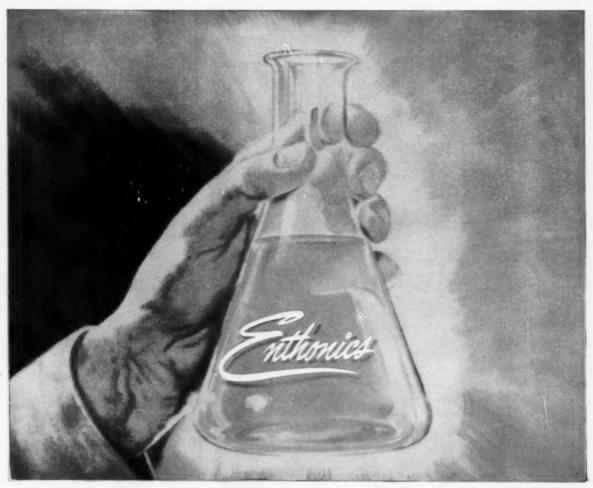
Chamfering time cut 70 pct by switch to cutting

A 70 pct reduction in chamfering time on cast alloy valve seats was reportedly obtained by D. W. Onan and Sons, Inc., Minneapolis. They converted from a grinding operation to a machining process employing solid square boring tool blanks manufactured by Kennametal, Inc., Latrobe, Pa.

The operation consisted of finish chamfering two 15/16-in. ID inserted valve seats on single cylinder engines for portable power plants.

Grinding had presented three problems: Requirement of a variety of wheel sizes: lack of rigidity in setup and constant maintenance for proper wheel angles.

On the initial run, with Kennametal tooling, 450 valve seats were completed with each tool before any



# \* The Scientific Solution of Metal Finishing Problems

"Enthonics" designates the scientific, analytical approach to the problems of the metal finishing industry as the basis for the technical service provided by Enthone, Inc.

Enthonics has as its objectives the solution of difficult metal finishing problems and the creation of finishes that provide new beauty, utility and durability for every type of metal and metal product. Dedicated to this program and method, Enthone, Inc. maintains a large staff of top-flight chemical engineers and metallurgists who devote their extensive technical training and knowledge to continuous and intensive research in the laboratory and in the field. The results of this research include more than 60 basic processes and chemicals that have made possible finer finishes at lower cost.

Widely recognized throughout industry as a pioneer and leader, and backed by the experience gained in over 20 years of outstanding achievement, Enthone has the ability to provide manufacturers with a complete engineering and advisory service. Basic or specially formulated chemicals or processes are expertly application-engineered to meet practically every type of individual finishing problem.

An outstanding example of "Applied Enthonics" was the creation of the "Alumon" process during the war years. Developed for the aircraft industry, this process is a method of electroplating aluminum to provide corrosion resistance and secure other properties such as reflectivity, heat resistance and solderability. The "Alumon" process is now used by hundreds of manufacturers to plate aluminum products with nickel, chromium, gold and many other methods. Future ads will feature other outstanding examples of "Applied Enthonics."

For complete information about Enthone products and processes, send for the Enthone *Product Index*; it's yours for the asking.



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Pumps

A wide variety of liquids are handled by Deming Vertical Turbine Pumps in diversified industries. Advantages over conventional pumps in comparable services include the following:

COMPACTNESS: A Deming Turbine with a 250 H.P. motor requires floor space only 3 feet square.

SIMPLIFIED PIPING: No suction piping required.

NO PRIMING PROBLEMS: Pumping element always submerged.

FLEXIBILITY OF DESIGN: Vertical multi-stage construction permits selection of correct number of stages for head and maximum efficiency.

LOW MAINTENANCE COST: Heavy duty, vertical construction eliminates side thrust. Centered discharge column permits accurate alianment.



All the facts on Deming Vertical Turbine Pumps are necessary to judge their advantages. Write:

THE DEMING COMPANY . 566 Broadway, Salem, Ohio

CALL YOUR
DEMING
DISTRIBUTOR
for help on pumps!



cutting position change. A 100 pct pressure test is described as not uncovering a single failure.

# Depth Adjustment Provided

The new setup consists of two special chamfering bars with pilots which enter the full length of the valve guides before the cut is started. Depth adjustment is provided by an adjustable nut at the shank end of the bar. A special head for driving the bars was designed at the company plant.

The chamfering tools are grade K8, Kennametal style SS610, solid



Chamfering bars have pilots going full length of guides.

square boring tool blanks, 3/16 in. square and 1½ in. long. The tools slip into square hole sleeves which are sweated into the bars, providing a 5° negative rake and cutting relief angle.

An Ex-Cell-O machine is used for the operation at a feed of 0.002 in.per-revolution and 200 sfpm. The total depth of cut is 1/32 in.

When the cutting edges become dull the tools are advanced so as to provide as many as 30 new cutting edges per tool without any regrinding.

# Nonferrous:

# Remelting can decontaminate metals having radioactivity

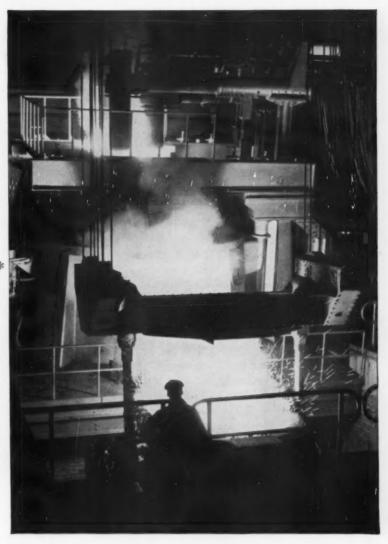
Investigation has revealed that nonferrous metals which have been exposed to radioactivity can be "decontaminated" by remelting. This was indicated in a paper made available by the U. S. Atomic Energy Commission.

The paper points out that in the course of handling and processing materials that are radioactive, the process equipment picks up measurable amounts of radioactivity. This is, of course, not an exclusive

The Largest in England...

# A 90-TON LECTROMELT\* FURNACE

A second 100-ton furnace is now on order with Lectromelt



BUILT by Birlec, Ltd., licensee of Lectromelt Furnace Company, this 90-ton furnace has just recently been placed in production. So satisfactory is its performance that a second, larger Lectromelt Furnace has been ordered by Samuel Fox & Company, Ltd. of Stockbridge (near Sheffield), England.

Lectromelt Furnaces, because of their many outstanding features, have made friends all over the world. They're at work in 35 countries on melting, smelting, refining and reduction work.

A new Lectromelt Furnace may be your answer to improved plant efficiency. Catalog 9-A describes these furnaces. For a copy, write Lectromelt Furnace Company, 312 32nd Street, Pittsburgh 30, Pennsylvania (a McGraw Electric Company Division).

Manufactured in . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Parls . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa . . . JAPAN: Daido Steel Co., Ltd., Nagoya

REG. T. H. U. S. PAT. OFF

WHEN YOU MELT... Lectromelt



# SINTERED POWDERED BRONZE BEARINGS AT THEIR

# most modern best!



Bunting's many years of experience in the manufacture and distribution of Cast
Bronze Bearings gives the highest standards of precision, quality and worth to the new
Bunting stock sintered Bronze Bearings.
These better sintered bronze products are now available from Bunting Distributors.

Bunting's research facilities and resources are producing quality, precision and unvarying uniformity in self-lubricating bearings made of sintered powdered bronze. Plain bearings, flange bearings, thrust bearings and bars made of this increasingly popular material now can be had in sizes and standards not heretofore available from stock.



Вотн Bunting Cast Bronze and Bunting oil filled, selflubricating sintered powdered Bronze Bearings and Bars are

available to you through your nearest Bunting Distributor. He has in stock all sizes for your immediate needs. Ask him or write for complete lists and dimensional data on

Bunting Cast Bronze and Bunting Sintered Bronze Bearings.





WATER SYSTEMS MONTH

NATIONAL





Bunting

BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS
OF CAST BRONZE AND POWDERED METAL

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property of radioactive materials; any chemical substance would be similarly picked up. With radioactivity, however, it is much more noticeable because of the extreme ease of measuring minute quantities of a radioactive substance.

Because of this simplicity of measurement, there has been great reluctance on the part of atomic energy installations, and in fact on the part of the Atomic Energy Commission, to permit any material which has had contact with a radioactive substance, and has therefore acquired even very small amounts of surface radioactivity, to be released to commercial trade channels.

### Removed Into Slag

Until about 1951, this prohibition with regard to metals was absolute. At that time, however, some work which was done by the Health and Safety Laboratory of the Atomic Energy Commission on the remelting of carbon steel showed that when such material was "contaminated" with natural uranium, substantially all of the uranium was removed into the slag during a normal open hearth remelting of scrap.

Uranium is the basic fuel material of the nuclear reactor, the coal, so to speak, of the nuclear furnace. It is easy, therefore, to imagine that very large quantities of this material are handled, and therefore large amounts of scrap are produced. On the basis of the tests which have been described, the Atomic Energy Commission was in a position to permit the release of many millions of dollars worth of scrap iron to the trade, and issued new regulations which permitted continuous release of such material under regulated conditions.

### Other Studies Undertaken

As a follow-up to the original study, the Health and Safety Laboratory has recently completed another similar study involving stainless steel, copper, nickel, and aluminum. All of these materials were resmelted using standard scrap reprocessing techniques and fluxes. It was found that stainless steel, copper, nickel and a nickel

# Revolutionary AlRengineering Development by Ingersoll-Rand.

# Torque control **IMPACTOOLS**

MULTIPLE TORQUE SETTINGS 2 TORSION BARS AVAILABLE:

- . No. L735. Max. torque 60 ft. lbs.
- . No. H735. Max. torque 90 ft. lbs.

Now you can have precision torque control with all the nut running power and speed of the world famous I-R IMPACTOOL

Size SO40T

\*For torques up to 550 ft. Ibs., a Sixe 5340T Torque Control Impacteel is available

... how can YOU use these ADVANTAGES ON NUT RUNNING JOBS where prescribed torques must be met?

- POSITIVE TORQUE CONTROL—a revolutionary use of a rugged steel torsion bar for precision control of torque-combined with the power and speed of the Impactool.
- SIMPLE TOROUE SETTING-torsion bar adjusting sleeve is clearly calibrated for changing torque with easy-to-use torque jig.
- TORQUE SETTING REMAINS CONSTANT-for any nut running condition until the adjustment is changed.
- ELIMINATES "OVER-TORQUE"-impact mechanism rebounds instantly when preset torque is reached, tripping a foolproof rubber faced shutoff valve.
- LOW MAINTENANCE-combines many of the proven features of Ingersoil-Rand Impactools, with their enviable record of dependable performance and low maintenance.
- REVERSIBLE-full power in either direction.
- NO CLUTCH-to wear, slip or require adjustments.



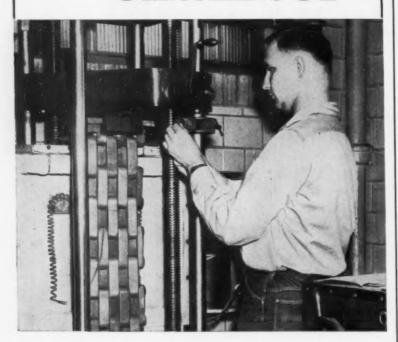
Torque can be quickly and easily set, using the jig as shown above. The torsion bar automatically shuts off the tool when the nut running resistance becomes equal to the stress in the preset torsion bar.

Ask your Ingersoll-Rand AIRengineer for a demonstration now . . . or write direct for more information on this amazing development.

Ingersoll-Rand

11 Broadway, New York 4, N.Y.

# torture



# Up to 30 tons' tension... to test conveyor belt life

In the Electro-Alloys physical laboratory, a Thermalloy conveyor belt is being set up for testing in a hot, tensile test furnace to determine load limits. Tension up to 30 tons can be applied here. This laboratory also carries on Brinell testing, tensile tests as cast, after-aging and stress rupture tests.

Testing of this type in our physical laboratory is just one phase of research and quality control at Electro-Alloys. Our Elyria plant has a completely equipped metallurgical laboratory for study of heat and abrasion problems encountered by our field sales engineers.

Let us put our facilities to work to solve your heat-treat problems—call your local Electro-Alloys representative or write for a copy of booklet T-225. Electro-Alloys Division, 7006 Taylor Street, Elyria, Ohio.

\*Reg. U. S. Pat. Off.—designating not just one but a group of alloys—each developed to meet specific heat and abrasion problems.

HEAT-RESISTANT CASTINGS • TRAYS • MUFFLES RETORTS • CONVEYOR BELTS • RADIANT TUBES



ELECTRO-ALLOYS DIVISION
Elyria, Ohio

stainless made from the nickel were all reduced from fairly high levels of surface contamination with uranium to very close to the amount of uranium that would be normally found in these metals. As a check against this irreducible minimum, the laboratory had samples of metal which were cast before 1940 submitted to it by the National Bureau of Standards.

### Aluminum Results Fair

Analysis of these samples established the "background" level. The resmelting of the aluminum, however, was not as successful as were the other metals. Further tests will be run to see if another type of slagging flux will not more successfully remove the uranium from the aluminum metal. It should also be mentioned that all of the tests, and the work that has been done with steel show that such reprocessing can be carried out without the slightest risk to the personnel involved.

On the basis of the preliminary results which were obtained, it appears that most metals which have had contact with uranium can be released as scrap in the same way as any other chemical industry scrap metal. The results which have been described are being studied in preparation for a review of the existing standards in order that a less restrictive flow of materials to and from the future private atomic industry can be assured.

# **Heat Treating:**

Warping in gun bolts prevented in heating

Warping in thin sections of .30 caliber machine gun bolts during a heat treating process is reported being prevented through the use of oxidation resisting Kentanium spacers.

Kennametal Inc., Latrobe, Pa., producer of the spacers, describes Kentanium as a material that resists oxidation, withstands thermal shock and retains strength and hardness at temperatures of 1800 degrees and higher.

In one ordnance plant operation,

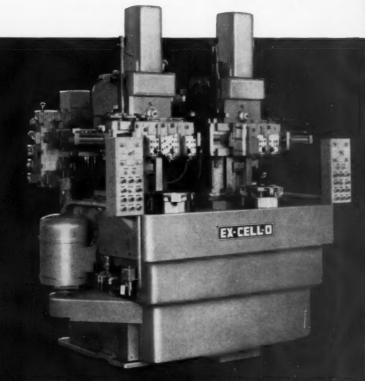
# New, ible

EX-CELL-0

2-STATION VERTICAL.

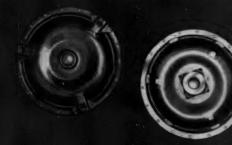


PERFORMS VARIETY OF PRECISION OPERATIONS



EX-CELL-O STYLE 432 VERTICAL PRECISION BORING MACHINE

has two independent hydraulic systems. No cams to change.

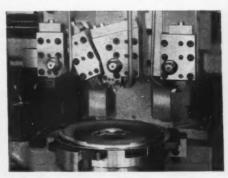


The Ex-Cell-O Style 432 completes the operations on both sides of this transmission torque converter cover in one machine cycle.

Ex-Cell-O's new Style 432 Vertical Precision Boring Machine was designed to speed production where flexibility is essential. Vertical construction means convenience in loading and unloading parts, also ease in adjusting and changing tools. Precision turning, boring, facing, grooving, and chamfering are performed alone, or in any combination.

Tool one station for operations on one side of a part; tool the other station for different operations on the other side. Or—let both stations do identical operations simultaneously or in sequence. Or—each station works as an independent machine. Different cycles are obtained through switches, and adjustment of dogs and orifices.

For complete information, call your local Ex-Cell-O representative, or write Ex-Cell-O in Detroit for Bulletin.



Tooling and chucking equipment of the left station. Slides are wide enough to accommodate tools on both sides of the centerline of a part.

EX-CELL-O CORPORATION Detroit 32, Michigan

MANUFACTURERS OF PRECISION MACHINE TOOLS - GRINDING SPINDLES CUTTING TOOLS - RAILROAD PINS AND BUSHINGS - DRILL JIG BUSHINGS AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS - DAIRY EQUIPMENT



200 straight tungsten carbide blanks were used to process 1200 bolts through eight furnace cycles. The blanks lost size and were damaged from oxidation. With Kentanium blanks, 200 pieces have been employed to heat treat as many as 14,943 bolts.

### Processing Hiked

The processing average was 6 bolts per blank by using straight tungsten carbide, but 74 bolts per blank through using Kentanium. The titanium carbide strips or



# Titanium carbide strips are inserted in bolt and clamped.

blanks—0.077 (plus 0.000 or minus 0.002) x 0.527 (plus 0.000 or minus 0.005) x 1% in. long—are inserted in the slotted open ends of the bolt and clamped to prevent the thin sections from warping.

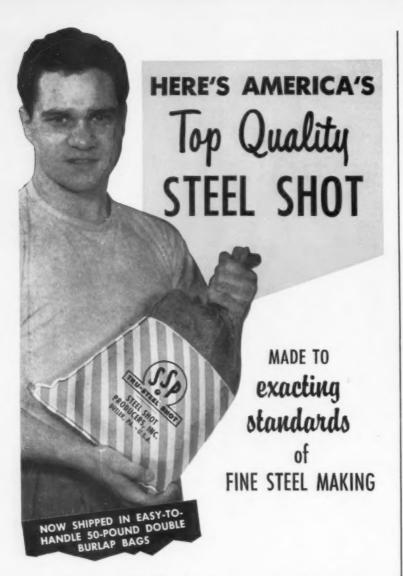
The treating cycle includes: Preheating at 1000°F for one hour, soaking in controlled atmosphere furnace at 1527°F for one hour, quenching in salt at 450°F for 20 minutes and drawing at 550°F for one hour.

# Metals:

# Gallium finds application as a glass sealant

Gallium, a long available but seldom used metal, has a promising new application as a sealant in the many glass joints and valves in laboratory vacuum equipment.

The use for the 80-year-old metal was discovered at the East St. Louis, Ill. works of Aluminum Co. of America's refining division. It makes possible the redesign of vacuum equipment to afford simplification and lower cost. In a recent experiment performed by



Round, solid, tough—Tru-Steel has everything you expect in steel shot—obtainable only through precision control of manufacturing processes, unsurpassed plant facilities and the

know-how of specialists whose only business is the manufacture of steel shot. Tru-Steel sells and stays sold on the basis of test and comparison. Write us.

Sold and recommended by Pangborn Corp. Hagerstown, Md.

TRU-STEEL'

Manufactured by
STEEL SHOT PRODUCERS, INC.

Alcoa's research staff the effective operating time of a tapered ground glass joint was more than doubled by the metallic gallium sealant.

## **Eliminates Dismantling**

The successful application of the metal that melts in one's hand, and boils at a temperature exceeding 3500°F, promises to reduce operating costs by eliminating repeated dismantling of retorts and tubing to clean and re-seal leaking joints. Intricate equipment can be operated efficiently with simple, low cost, smooth glass joints that work best with gallium.

Joints usually fail because silicone grease, most widely used sealing medium, is subject to evaporation by high vacuum, and is dissolved by cleaning solutions.

## Clings Instantly

Gallium resists both attacks, and three of the silvery metal's amazing properties make it ideally suited as a sealant. A liquid at 86.5°F, gallium is easily inserted in the joint sleeve, and it clings instantly to the glass surface. As it cools to room temperature, gallium again becomes solid and expands, forming a perfect seal. Its low melting point also simplifies subsequent equipment dismantling and reassembling.

# Casting:

# Six-day course planned in investment casting

The six-day intensive course in investment casting at the University of Michigan, September 10 to 15, 1956, will be sponsored by the Investment Casting Institute.

The course has been arranged by Ted Operhall, president of Misco Precision Casting Company, who is chairman and members of his ICI University Liaison Committee in cooperation with Dr. Richard A. Flinn of the College of Engineering of the University of Michigan.

Because of the laboratory experiments which are to be a part of the course, registrations were



Production economy demands top-quality hoists that are fast, rugged, safe and easy to maintain. You get all four essentials in the Series "700" 'Load Lifter' Electric Hoist.

The Series "700" 'Load Lifter' speeds load handling on every job. With only 24 volts at the push buttons, the operator is safe. It has a load brake and a motor brake. The full load can be held safely by either brake *alone*. Braking action is fast and safe. The load can't drop back. Accurate spotting is never a problem.

The Series "700" 'Load Lifter' Electric Hoist is built extra tough to stand up in the toughest services. Every moving part is engineered and manufactured to function smoothly and without needless wear. Safety construction and safety devices provide complete protection against operational hazards. The hoist can be inspected and serviced in the air, without removing the load. Capacities range up to 15 tons. Single and two-speed models available with your choice of suspension. Get details from your "Shaw-Box" Distributor or write us for Bulletin 410.



MANNING, MAXWELL & MOORE, INC.

Builders of "'SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties, Makers of "ASHCROFT" Gauges, "HANCOCK" Valves, 'CONSOLIDATED' Safety and Relief Valves, "AMERICAN" and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

limited to 40 persons from the Institute's member companies, and the enrollment was over-subscribed two weeks after the initial announcement

The course will detail six subjects with both lectures and laboratory experiments to be utilized. Subjects include investment materials; gating and risering (mold design); melting, refining, and degassing; properties of heat resistant alloys; new techniques and

developments; and a seminar on precision casting methods, methods of instrumentation, furnace design, furnace atmospheres, and desirable thermal cycles.

# Forging:

Large crankshaft developed from 210,000 lb ingot

A crankshaft was forged at Erie Forge & Steel Corp., Erie, Pa. from a 72 in. diam medium carbon steel ingot weighing 210,000 lb.

The weight of the rough forging was 108,460 lb, slab size 345/8 in. x 23 in., and it was approximately 45 ft long. At Erie Forge & Steel plants this forging was machined to 46,000 lb finished weight. Finished crankshaft is 43 ft, 9 in. long by 151/2 in. journal diam.

Bearing surfaces are polished to mirror finish.

# PRECISION

BORING . GRINDING . MILLING

An exhibit of the latest and finest in Spindle design and performance, to reduce your tolerances and production costs.

### EXHIBIT A

POPE SUPER-PRECISION, HEAVY DUTY BORING SPINDLES for boring holes round within millionths of an inch. Available in both belt driven and motorized units to meet a wide range of speeds and horsepower. Send us your specifications for quotations.



### EXHIBIT B

with

SPINDLES

PRECISION



POPE 1 HP, TOTALLY ENCLOSED 3600 RPM MOTORIZED, CARTRIDGE TYPE PRECISION SPINDLES with double row cylindrical rafter bearings and separate thrust bearings for no endwise movement of the shaft

EXHIBIT C

NEW POPE QUICK.

SELF-REMOVING

WHEEL HOLDER

for surface grinders and tool

and cutter grinders — elimi-nates the necessity of a wheel

puller. Write for quotations.



POPE HEAVY DUTY, TO 100 HP DIRECT

MOTORIZED

SPINDLES for Horizontal or Vertical Skin Milling, Grinding, Milling, Boring and Other Operations

### EXHIBIT D EXHIBIT F



POPE HEAVY DUTY VEE-BELT DRIVEN, PRECISION MILLING SPINDLES, and Wheel Heads, 1/2 to 50 HF

EXHIBIT G

POPE INTERNAL GRINDING SPINDLES for Bryant, Excelle, Heald and Landis Grinders

# EXHIBIT E



POPE SUPER-PRECISION MOTORIZED TOOL AND CUTTER GRINDER SPINDLES with clearance Angle Swiveling Heads for Angula ment In A Vertical Plan lar Adjust-

## EXHIBIT H



PUPE SUPER-PRECISION
HIGH FREQUENCY HEAVY
DUTY GRINDING AND MILLING SPINDLES for speeds up to 100,000 RPM

Established 1920

MACHINERY CORPORATION 261 River Street Haverhill, Massachusetts

WRITE FOR COMPLETE SPECIFICATIONS, PRICE AND DELIVERY

Builders of the Revolutionary New POPE Super-Precision Boring Machine That Bores Holes Round Within Millionths of an Inch.



Unit was machined to 46,000 lb finished weight.

# Controls:

Fluid Controls Institute adopts standard terms

The Fluid Controls Institute, formerly the National Steam Specialty Club, an organization including manufacturers of control valves, regulators, solenoid valves, controllers and other auxiliary control equipment, has announced adoption of a standard classification and terminology system for valves.

### Aims Ending Ambiguity

The project was undertaken by the Institute to provide a practical framework of standard terms for operating engineers', instrument engineers' and mechanics' everyday use. It is expected to clear up existing semantic ambiguities and uncertainties, and at the same time, provide a broad base for new and accepted names and terms which should be recognized and preserved.

Results of the project are published in a 12-page booklet entitled, "Standard Classification and Terminology for Power Actuated Valves" which is available from Fluid Controls Institute, Box 191, Decatur, Ill.

# Methods:

Holding device simplifies electrical assemblies

Attaching screws and safety wire on mechanical ends of wire assemblies is done 25 pct faster with a new holding device developed by Glenn L. Martin Co., Baltimore.

The wire assembly is plugged into a tool having a "T" pin handle. The tool is inserted into a wooden receptacle, rotated, and indexed to suit the worker. The holding unit is portable, attaching to a table or work bench by thumb screw.



Tool is inserted in receptacle, rotated and indexed.

# Metals:

Aluminum cited better for power cable sheathing

Bare aluminum has reportedly been used for the first time in the United States as aerial power cable sheathing in two 6000-ft transmission lines at North Tonawanda, N. Y.

This use of aluminum in place of conventional lead is described as producing a sheathing six times as strong and only a fifth the weight of lead.

A new technique which permitted the aluminum sheathing to be joined with high strength welds without subjecting the cable insulation to elevated temperatures made the project possible. Niagara Mohawk Power Co., builder of the lines, devised the method from basic welding information supplied by Aluminum Co. of America.

The installation also features a new type of extruded cable clamp developed by Alcoa. The new clamps, which can be cut to any length from a special extruded shape, are used for mid-span, turns, and dead-ends. The cable clamps reportedly offer four advantages-low first cost; elimination of a large parts inventory; a high strength, non-corrosive aluminum alloy; and a clamp versatile enough to be made into any

A splicing sleeve of 3003 aluminum alloy made possible the welding method of joining the cable sheathing. The splicing sleeve is 5 in ips x 0.258 in. wall x 32 in. long equipped with two filling bosses. This sleeve was joined to the ends of the cable sheath on each side of the splice by two aluminum bell shapes. One end of the bell shape was made to fit the inside of the flared cable sheath and the other end to fit the inside of the splicing sleeve.

To simplify welding, the bells were made with a tapered wall.

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- PISTON RODS
- DIE BLOCKS (T TEMPER)



# STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION

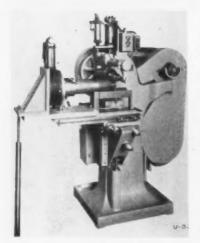
TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA., and WARREN, PA.

Offices in Principal Cities



New and improved production ideas, equipment, services and methods described here offer production economies...for more data use the free postcard on page 113 or 114.



# Miller used for semiautomatic stake notching

Equipped for automatic feeding and indexing, this milling machine is being used for semiautomatic stake notching of 105 mm and other projectiles on a production basis. Head of the unit is equipped with a 4 in. stroke air-hydraulic feed, which provides rapid traverse approach, controlled cutting speed and distance, and automatic rapid return. The projectile is held in a "cup type" holding collet, secured to the center of a pneumatic rotary table. The table is equipped with a 5 division index plate and its operation is coordinated by the use of limit switches with that of the head feed. Sequence of operation is as follows: The projectile is moved from conveyor line into the grooved fixture provided and slid into position in the cup type collet. A partial turn of the locking handle secures it in place. Operator presses the starting button to mill the first stake notch. At the conclusion of the milling stroke the head retracts rapid traverse, and table indexes. Operation continues until notches are done. The U. S. Burke Machine Tool Div.

For more data circle No. 28 on postcard, p. 113



# Table extensions aid setting-up plate sawings

Setups for straight or angle cuts in metal plate or flat stock can be made in a few minutes with a new table accessory for one firm's sawing machines. Described as simple, but convenient, this accessory consists of T-shaped bars designed to fit the T-slots in the hydraulically actuated tables of these machines. The bars can be slid in or out of the table slots independently and quickly locked in any position with a wrench. In this manner the bars

can be adjusted to provide outboard support for stock longer than the capacity of the table. Studs on the ends of the bars serve as stops. Bars can be adjusted so that the studs bear against the edges of rectangular or irregularly shaped pieces which have been placed on the band machine table in the desired position for cutting. Once bars are set, any number of pieces can be cut rapidly. DoAll Co.

For more data circle No. 29 on postcard, p. 113



# Checker inspects spur gears up to 251/2 in. OD

This gear checker inspects spur gears up to 25½ in. OD as well as splines for accuracy of tooth size, spacing, eccentricity and parallelism. Spur gears and splined parts up to 11¾ in. between centers can be accommodated on the new checker. One of its main features is a type of slot design in the table surface which positions the various checking units in precision straight line and right angle locations. This slot has a combination of straight

and angular sides which permit, the maker states, more accuracy, hold-down power and less wear. Gears to be checked are mounted between centers on head and tailstock units which are slidably mounted through a slot in the top of a ribbed surface plate. Interchangeable heads are provided for checking eccentricity and size combination and for tooth-to-tooth spacing, maker says. National Broach & Machine Co.

For more data circle No. 30 on postcard, p. 113



to courtesy 20TH Century Mfg. & Supply Co., Tulsa, Oklahoma

### We are extremely proud of the job our PORTAGE mills are doing"

The Portage Machine Co. Akron, Ohio

Gentlemen:

Our business, as you know, is Contractors of Metal Products. This particular job is a steel forging being machined, and when finished will be a fluid cylinder for a high pressure pump used in the oil industry. These forgings are made from AISI-4140 steel and we are extremely proud of the job PORTAGE mills are doing.

We find our PORTAGE mills very accurate. These mills must repeat themselves in each location and operation often during the machining operation. Specifications call for very close tolerances and we have no trouble in doing this precision work.

Yours truly, 20TH Century Mfg. & Supply Co.

Possalloway

R. G. Galloway

President





Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

# 0.







### Micro-hardness tester completes cycle in one minute

Combination micro-hardness tester and metallurgical microscope of non-destructive type, with a load-weight range of from 25 to 1000 grams, is described as requiring only one minute for a complete test cycle. Interchangeable vise accessories permit the instrument to be used for testing small precision ground or lapped parts, small diameter wires, very thin materials or material coatings, thin sheet stock, cutting tool edges and ball bearings. Vertical capacity of the unit

is 23% in. and the maximum spread of standard vise jaws is 1 11/16 in. Surface finishes of 40 rms or less can be inspected, and indentations of 0.0004 in. or smaller can be measured to within an accuracy of 0.00008 in. The spot to be indented can be located to within an accuracy of 0.0002 in. Green light in instrument head shows indenter contact with the work and red light shows cycle is complete. Adaptable for photomicrographs. Sheffield Corp.

For more data circle No. 31 on postcard, p. 113

### Gear speeder incorporates electronic "ear"

This fully automated gear speeder includes an electronic "ear" which automatically inspects and rejects gears based on operating sound level. The machine has been specifically designed to avoid human sound level appraisal errors which have been proven to vary with fatigue and mental attitude. With the new unit, gears are automati-

cally loaded, run in both directions in mesh with another gear with and without brake loading, unloaded, and passed or rejected by an electronic sound discriminator unit whose microphone is placed near the gear mesh area. Sound discriminator unit may be adjusted. National Broach & Machine Co.

For more data circle No. 32 on postcard, p. 113

### Creep tester holds four specimens simultaneously

A new multiple creep rupture testing machine of the lever type in which four specimens can be held simultaneously under loads up to 4000 lb has been announced. The special four-specimen electric furnace is under automatic temperature control of a single-point indicating and recording controller

which will hold specimens at any temperature up to 1800°F. Specimens can be loaded in increments of 5 lb. A feature of the creep machine is a dashpot in each of the lever systems which prevents transmitting shock. Baldwin-Lima-Hamilton Corp.

For more data circle No. 33 on postcard, p. 113

### Bench oven provided with large working area

With a working space of 36 in. x 36 in. x 36 in., this bench oven has a temperature range of 100°F to 350°F. It is recommended for such applications as baking enamels, lacquer, wrinkles and other finishes; for dehydrating coil forms; for drying and for preheating molds; and for laboratory uses.

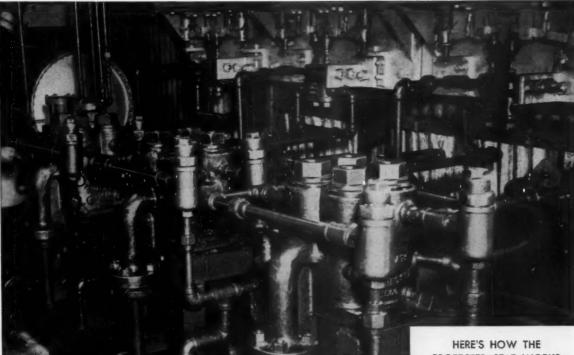
Features include uniform temperature throughout by means of fan driven forced air circulation and wide range of constant temperature through an adjustable damper. Construction of unit is heavy gage steel with a minimum of 2 in. Fiberglas insulation. Grieve-Hendry Co. For more data circle No. 34 on postcard, p. 113

### Drill positioning table reproduces hole pattern

Described as an entirely new type of positioning table for production drilling operations, this unit will reproduce any pattern of holes within its capacity. Simple in design, it is fast acting and accurate within 0.001 in. The table consists essentially of a movable portion

which rides freely over a predetermined area on ball thrust bearings; a removable hole location plate which carries the particular hole pattern to be reproduced; and an air-actuated locking mechanism. Howe & Fant. Inc.

For more data circle No. 35 on postcard, p. 113



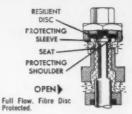
for fast, smooth, accurate control

# Specify **HOMESTEAD** Protected Seat HYDRAULIC OPERATING **VALVES**

### RECORDS OF 6 TO 18 MONTHS' MAINTENANCE-FREE SERVICE ARE COMMON

It will pay you to get the facts about HOMESTEAD Protected-Seat HYDRAULIC OPERATING VALVES—the valves that give you quick, finger-tip control for moving or positioning any single-acting or double-acting hydraulic piston. The exclusive Homestead Protected-Seat reduces fluid velocity during the closing operation to practically zero. Thus seat erosion and resultant leakage, the most frequent cause of shut-downs and lost production time, is eliminated. Records of 6 to 18 months continuous service without maintenance are common.

PROTECTED SEAT WORKS





### CLOSING OR 4 OPENING

Flow practically stopped by close fitting sleeve and stem shoulder, before seat and disc make contact. This prevents "wire drawing." Trapped water cushions closing, dampens hydraulic shock.



CLOSED )

Protected resilient disc against metal seat as-sures drop-tight seal long life, accurate con-trol, and low mainte-



OMESTEAD E MANUFACTURING COMPANY "Serving Since 1892"

P.O. BOX 23, CORAOPOLIS, PA.

SEAT HYDRAULIC OPERATING	VALVES.
NAME	
COMPANY	TITLE
ADDRESS	
CITY	STATE

### Barrel plater

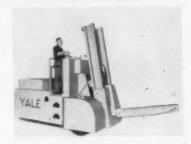
Announcement has been made of a new clear plastic utility barrel plater. It can be hung on the cathode rod in any plating tank and is capable of being plugged into the nearest electrical outlet.

The hexagon-shaped, high temperature Plexiglas cylinder is described as resisting all normal plating solutions and temperatures up to 180°F. Lasalco, Inc.

For more data circle No. 36 on postcard, p. 113

### Steel mill truck has hydraulic brakes and tilt feature

This new medium capacity range steel mill truck of electric power has hydraulic wheel brakes and a hydraulic tilt feature for load safety. Every truck in the line can be equipped with a five degree backward and three degree forward tilt feature. The trucks, available in capacities of 18,000 to 30,000 lb, can be equipped with forks, a ram or a hydraulically operated split ran. The units can be powered with a



battery or a diesel or gasoline engine generator power plant. Smooth operation is assured through maker's Magnetic Cam-O-Tactor or—in engine generator powered models—a variable voltage control.—Yale & Towne Mfg. Co.

For more data circle No. 37 on postcard, p. 113

### Shallow grooving tools

A line of indexible carbide-insert multicut tools for all types of shallow grooving cuts has been introduced. Except for the insert itself and the locking bank of the holder, all parts are of standard design. Inserts are modified from the company's D-80 inserts and may be used in 4 positions (2 for each end) before requiring resharpening. Advantages cited are the following:



Tools are always on size for depth and width since the insert is merely indexed in the holder to present a new sharp cutting edge. Grinding costs are lower because of the 4 edges per insert and the elimination of the need for form grinding, the maker states. Wesson Co.

For more data circle No. 38 on postcard, p. 113



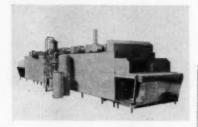
ERIE BOLT & NUT CO.

Erie, Pennsylvania

Representatives in Principal Cities

### Water washer

No residual matter or water marks are left on metal by this automatic water washer for cleaning of metal parts or products. Purity of surface is obtained through a series of cleaning stages, which include rinsing with de-ionized water so chem-



ically inert that it is equal to water that has been triple distilled. The washer is so designed that all wash water solutions and rinse water can be re-used over and over again. Can be used as a single conveyor or multiple belt unit. Stoelting Bros. Co.

For more data circle No. 39 on postcard, p. 113

### **Barrel handling truck**

Drum and barrel truck is described as making it possible for one operator to easily place heavy drums on pallets. The manufacturer states that the design of the cart allows the truck's shoes to be placed on edge of the pallet so that in one forward motion the drum can be elevated to the pallet with a mini-



mum of operator effort. It is also said that drums can be safely lowered from pallets with this cart. Another feature is a chime hook dropped as truck is moved without operator touching either hook or barrel. Valley Craft Products, Inc., Div. of O'Neil-Irvin Mfg. Co.

For more data circle No. 40 on postcard, p. 113

### Comparator measures thread leads of large diam

Bench model lead comparator, capable of measuring the lead of threads in larger diameters and in longer lengths, is being introduced to the thread industry. This model is described as having a thread diameter range of from 0.112 to 2 in. Length capacities, between points, are from ½ in. to 6 in. Accuracy to within 0.0001 of an inch is stressed. On pieces, such as bolts,

where the thread diameter is smaller than the body diameter or the head diameter, the comparator is described as providing an easy, convenient time-saving method for inspection. It inspects threads without removing the driving dog from the work and it requires no adjustment to centralize with the centerline of the work piece. Jerpbak-Bayless Co.

For more data circle No. 41 on postcard, p. 113

FOUND WHERE FINE BUSINESS MACHINES ARE "BORN"



# How USS GERRARD speeds handling—cuts costs



"We have been able to cut handling time, give our customers better service, balance our work load, save storage space, and reduce brick breakage through the use of USS Gerrard Round Steel Strapping," says Glen-Gery Shale Brick Corporation of Reading, Pa., largest building brick manufacturer in the East. Glen-Gery uses 12-gauge USS Gerrard Round Strapping to package bricks in easy-to-handle units of 500.



"We rely on USS GERRARD Strapping to get our houses to the building sites in perfect condition," says West Coast Mills, Chehalis, Washington, manufacturers of prefabricated Far West Homes. These attractive prefabs are shipped all over the United States by rail and truck, bundled securely with USS GERRARD Round Steel Strapping. They arrive consistently at the building sites with every piece intact.



"We reduced handling time by 75%, increased storage space by 33%, and cut shipping damage to less than 1%, by palletizing our tuyeres with USS Gerrard Flat Steel Strapping," says Climax Fire Brick Company of Climax, Pa., producer of 60% of the nation's requirements for these odd-size Bessemer Furnace fire bricks.



Waterproof-wrapped for shipment, this coil of sheet steel is being reinforced with USS GERRARD Flat Steel Strapping. Notice how strip of strapping inside coil exerts outward tension, keeping protective paper in place.

Bring your packaging-tying problems to USS GERRARD. Regardless of what they are, our engineers will help you find the safest, surest, most economical solution to them.

NEW CATALOG—HOT OFF THE PRESSI 36 pages of photographs, descriptions, facts and figures on all USS GERRARD Steel Strapping and associated equipment.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CHICAGO, ILLINOIS

### **NEW EQUIPMENT**

### Cleaning unit

A new batch-type airless abrasive blast cleaning machine makes possible faster cleaning by hurling a large volume of abrasive on the work. This is accomplished by a single super-capacity blast unit that throws 830 lb of abrasive per minute, or more than twice as much abrasive per minute as any similar-



ly sized wheel previously used. The abrasive shower of the new supercapacity wheels spreads over cleaning chamber in a more uniform manner. Machine has been designed for cleaning sand, scale, and oxides from any work that can withstand tumbling. Wheelabrator Corp.

For more data circle No. 42 on postcard, p. 113

### Redesigned machine

This unit has been redesigned and rebuilt to process a workpiece thus changed. The workpiece is an aluminum regulator valve body for an automotive transmission. As rearranged for its new production job, this special machine is equipped



with a six-station rotary indexing table. Each station has two fixtures to permit reloading for operations on the reverse side of the part, after the first side has been machined. A hydraulic cam clamp retains the workpiece through the machining cycle. Net production rate for the machine is 120 parts per hr. Ex-Cell-O Corp.

For more data circle No. 43 on postcard, p. 113



### Another of the Reasons Behind Brad Foote Quality-

• The heat treatment a gear receives is probably the most important single factor in determining its long range wear characteristics. Here at BRAD FOOTE we pride ourselves on having equipment designed to provide the widest possible variety of heat treatments.

 But in addition to standard heat treating and testing equipment we have a few extra safeguards. One of these, rather unusual in our business, is a complete Metallographic laboratory. Specialized equipment allows us to examine or photograph the grain structure of all of our metals, in order to determine the most effective methods of heat treatment and to serve as a check on the quality of finished work.

· Metallographic examination is just one of the many reasons behind BRAD FOOTE quality. Prove to yourself the savings this extra quality can mean. Let us quote on the gear requirements for your next program, without obliagtion.

BRAD FOOTE MAKES ALL TYPES OF GEARS-



AMERICAN GEAR & MFG. CO PITTSBURGH GEAR COMPANY

# This 25-TON Hannifin Straightening Press Sells For

\$4,133 FULLY EQUIPPED AS SHOWN

Price F.O.B. our press plant at St. Marys, Ohio, subject to change without notice

The ideal press for straightening heattreated parts up to 60" between centers. Exclusive Hannifin Sensitive Pressure Control for speed and accuracy. Ram block, two table blocks and center-type fixture complete with rails included.

### STRAIGHTENING PRESSES FROM 5 TO 150 TONS

Hannifin offers longer tables and rails, roller-type fixtures, larger or smaller capacities (5 to 150 tons)—all at prices that are easily justified by savings on the job. Bring us your straightening problems.

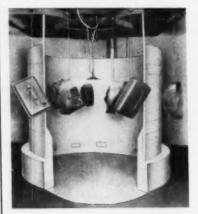


HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS



### Electrostatic spray system

A new paint spray system utilizes a conveyor which forms almost a complete closed loop around an "ionic gun" which is mounted in the center of the loop reciprocating vertically. A cone of disk shaped ionizing electrode is attached to the "atomic nozzle" on the ionic gun. The spray pattern can be adjusted to furnish either a 360° or



umbrella shaped pattern by simply moving the outer sleeve of the nozzle either forward or backward. It is set so that the spray will hit the cone or disk shaped electrode and deflect off of the same in the form of a mist. The ionized mist is attracted to the work being processed which is at ground potential on the conveyor. Scientific Electric, Ionic Spray Div.

For more data circle No. 44 on postcard, p. 113

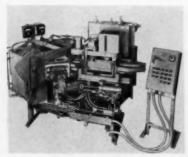
### Cloth and sisal buffs

Fast, thorough cutting and coloring of intricate contoured metal surfaces are reported as provided by a new line of cloth and sisal buffs. The buffs, it is stated, will cut and color metal in a single operation, due to their design and the materials of construction. They utilize double-folded tufts to provide maximum cutting surfaces and retain compound at leading edges and on the buff circumference. A steel center, composed of two steel disks, provides strong support for each buff. Steel clamps around the circumference of disks hold the buff in place. Heavy-duty stitching around the buff's inner circumference. Hanson-Van Winkle-Munning Co.

### **NEW EQUIPMENT**

### Rotary core machine

Precision hollow cores are mass produced in a 15-second cycle by this newly developed rotary core machine. The unit has been developed to provide production foundries with a high-speed automatic machine capable of producing accurate, ready-to-use hollow cores in large volume. It accommodates six core boxes up to 10 x 12 x 6 in. in



dimension. All operations, except for actual removal of the finished cores, are automatically controlled by precision valves and electrical equipment. In addition, the machine features an automatic thermostatically-controlled oven and insulated oven-sealing doors to assure constant and accurate curing temperatures for blown cores. Spo. Inc. For more data circle No. 46 on postcard, p. 113

### Band saw

A metal cutting band saw for production cut-off work is equipped to handle rounds to 10 in. and rectangular shapes 10 in. x 16 in. with extra capacity for end cuts up to 11 in. in diam. It is driven by a 3/4 hp ball-bearing motor and uses 1 in.



wide blades. It has structural rigidity produced by the design of its rugged counterbalanced frame, guide beam and its heavy duty blade guides. The unit has selective speeds of 50, 100, 175, and 275 fpm. Wells Mfg. Corp.

For more data circle No. 47 on postcard, p. 113

# "Like two peas in a pod"

That's the description of two identical WSM stampings from two different runs, several years apart.

Dependable uniformity in these component parts is the result of skilled engineering design and accurate tools . . . plus over 70 years of precision stamping experience.

WORCESTER

STAMPED METAL 0



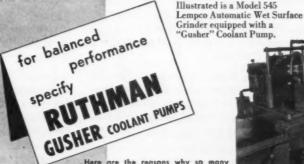
Why not give us the chance to prove we have the specific knowledge and complete equipment to turn out accurate stampings more advantageously than you can "do it yourself.'

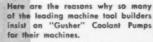
Write for descriptive folder . . . or let our representative call in person . . , without obligation.

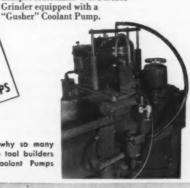
### **VORCESTER STAMPED METAL**

10 HUNT ST., WORCESTER, MASS., U. S. A.

SPECIALISTS IN SKILLED STAMPING SERVICE







BETTER PERFORMANCE - No priming is neces-- Gusher pumps deliver split-second flow from a trickle to full volume.

LESS MAINTENANCE—Heavy duty pre-lubricated ball-bearings and the absence of packing, foot or relief valves reduces the need of attention to a minimum.

LONGER LIFE -The rotating assembly of all "Gusher" Pumps is dynamically balanced . . . to reduce vibration and wear. There is no metal-to-metal contact within the pump housing. Gusher Pumps are precision built for a long trouble-free life.



**MODEL 11022** 

### THE RUTHMAN

1809-1823 READING RD.



CINCINNATI 2, OHIO



### or solid



### a steel tube or bar for every purpose

### TUBING: SEAMLESS AND WELDED

Whatever your tubing requirement—whatever kind and quantity you need—you can get quick delivery of a quality product with a single call to Ryerson.

That's because Ryerson stocks are the nation's largest, including more types and sizes, more tonnage, than any other source. And Ryerson service facilities are unequalled, too.

Hack saws, band saws and equipment for production lathe cutting and chamfering assure quick service on your orders. In addition, a staff of tubing specialists puts years of experience to work on your problems of tubing selection and fabrication. So call Ryerson for everything in tubing and tubing service.

In stock: Cold drawn and hot rolled seamless mechanical tubing, hot and cold rolled welded tubing, hydraulic and cylinder tubing, structural tubing, etc.

### COLD FINISHED BARS

Careful handling, accurate cutting, vigilant inspection—these are just three of many ways in which Ryerson assures you of the highest quality in cold finished bars.

Stored in temperature-controlled rooms, spark-tested to guard against mixed steels, Ryerson cold finished bar stocks include rounds, squares, hex's, flats—screw steel, accuracy stock, turned, ground and polished shafting, Ledloy for fastest machining—everything you need. And even the hard-to-get intermediate sizes are on hand.

To help you select the best cold finished bar for each application, we have just published a simplified guide showing the comparative strength, cost, machinability, workability, etc. of all commonly used types. Write for your copy and call Ryerson when you need high quality cold finished bars.

## RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK . BOSTON . PHILADELPHIA . CHARLOTTE, N. C. . CINCINNATI . CLEVELAND DETROIT . PITTSBURGH . BUFFALO . CHICAGO . MILWAUKEE . ST. LOUIS . LOS ANGELES . SAN FRANCISCO . SPOKANE . SEATTLE



### The Iron Age SUMMARY . . .

Steel labor negotiations could get rough this year . . . Expensive demands of union expected to meet with resistance . . . Market holding up despite auto cutbacks.

Labor Outlook . . . The stage is being set for one of the toughest steel wage bargaining sessions in recent years. Steel labor is talking big—and expensive—and some steel leaders are not disposed to give in without a fight.

Talk of a cut-and-dried settlement this year has gone by the boards. Sparks will fly when steel labor's demands meet head-on with a determination that this is the year to hold-the-line.

Whether negotiations are settled peacefully depends on how serious labor is about going after the more expensive demands it is expected to make, particularly premium pay for weekend work. This would be costly in terms of both money and rescheduling of operations.

But regardless of the steel wage hassle outcome, more steel people are growing optimistic over the third quarter market outlook. While the ingot rate is expected to drop from present levels, at least part of the decline will be due to vacation, maintenance, and hot weather.

On The Fence... Detroit seems to be on the fence at the moment. Automotive steel buyers are holding off on making third quarter commitments until the last minute. Most claim their inventories are ample. But a pickup in new car sales would bring a quick turnabout. The auto companies still have to place tonnage orders for 1957 model production.

Appliances are taking up a lot of the slack in sheets caused by reduced automotive buying. A Detroit steel producer that sells both to auto companies and appliance makers says it expects to be busy on sheets through third quarter.

The situation in plates and structurals is still desperate, although producers are shifting rolling mill schedules to increase production of both products. Plates are particularly critical. Some plate converters are offering to buy ingots at \$20 over regular market price. Foreign plate producers are doing a landoffice business.

Meanwhile, expansion in steel, automotive, oil and gas, aircraft, the highway program, and the boom in capital equipment buying are shoring up any shortcomings of other steel-consuming industries.

Scrap Letdown . . . Several weeks after setting a new all-time high, prices of steel scrap headed sharply downward this week in most consuming areas. Price declines of as much as \$3 per ton were reported. The reductions took the pressure off demands for more stringent scrap export restrictions.

### Steel Output, Operating Rates

Donal Mari	This	Last	Month	Year
Production	Week	Week	Ago	Ago
(Net tons, 000 omitted)	2,388	2,375	2,462	2,334
Ingot Index				
(1947-1949=100)	148.7	147.8	153.3	145.3
Operating Rates				
Chicago	100.0	98.0*	100.0	99.5
Pittsburgh	101.0	100.0*	103.0	100.0
Philadelphia	105.0	104.5*	100.0	98.0
Valley	99.0	99.0*	98.0	99.0
West	105.0	106.0*	103.0	99.0
Detroit	98.0	98.0	97.0	94.0
Buffalo	105.0	105.0	105.0	105.0
Cleveland	104.0	101.5*	104.0	105.0
Birmingham	23.5	23.5	93.0	93.5
S. Ohio River	91.0	89.0*	94.5	91.0
Wheeling	104.0	106.0	103.0	98.0
St. Louis	97.0	94.0	100.0	106.0
Northeast	90.0	90.0*	92.0	104.0
Aggregate	97.0	96.5	100.0	96.7
*Revised			,	

### Prices At A Glance

cents per lb unless otherwi	This	Week	Month	Year
	Week	Ago	Ago	Ago
Composite price				
Finished Steel, base	5.179	5.179	5.179	4.797
Pig Iron (Gross Ton)	\$60.29	\$60.29	\$60.29	\$56.59
Scrap, No. 1 hvy				
(gross ton)	\$53.17	\$55.00	\$54.83	\$34.67
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	33.25	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	97.875	98.375	99.50	91.50
Zinc, E. St. Louis	13.50	13.50	13.50	12.00

### Inventories In South Critical

Many fabricators facing shutdown if striking trainmen and sympathetic mill workers at two T.C.&I. plants do not return to jobs by next week.

◆ A STRIKE of 250 trainmen at Tennessee Coal & Iron Div. of U. S. Steel has revealed that southern steel fabricators, working at full speed for several months, have barely been able to maintain inventories.

T.C.&I.'s big steel producing plants at Fairfield and Ensley, Ala., were forced to a standstill when steelworkers refused to cross the trainmen's picket lines. Closing of the two plants has cut steel production in the Birmingham district to 23.5 pct of capacity.

With the strike only a week old, some fabricators already have begun to feel the pinch. If the shutdown continues another week, many fabricators will begin curtailing production and laying off workers.

Ingalls Iron Works Co., was the first fabricator to feel the pinch and already has laid off some workers. "Few if any fabricating plants in this entire district have inventories of any size," stated Robert I. Ingalls Jr., president.

Other plants reporting short inventories include American Bridge Div. of U. S. Steel, Nashville Bridge Co., and Chicago Bridge and Iron Co. The impending shutdowns seem to resolve, in the South at least, conflicting statements in reference to inventory building by several big steel company chairmen.

Meanwhile negotiations between T.C.&I. management and the Brotherhood of Locomotive Firemen and Engineers had bogged down early this week.

SHEET AND STRIP . . . Pittsburgh market for flat-rolled products, especially cold rolled, has lost steam. Although mills are still operating at capacity, the backlog of demand that existed earlier is gone. In Chicago, automotive users are taking their full quota of cold rolled for third quarter in spite of strong inventories. Hot rolled sheets continue better with some producers expected to move at high levels during the summer. Strip bookings are picking up again for the third quarter. Detroit sheet sales are going strong, will probably continue through third quarter. The situation is not the same for strip, where automotive demand has tapered off considerably. Great Lakes and Republic have boosted extras on sheets over 72 in wide by 31/2 to 4 pct. J. & L. followed.

BARS... In Chicago, this grade seems to be holding itself up without visible means of support. Mills operating at capacity despite cutbacks in two biggest markets, auto and farm equipment. Rate expected to continue until seasonal dropoff in July. The market in Detroit is easing, especially for carbon bars. Auto companies still reshuffling production schedules to keep inventories in line with sales. West Coast reports a growing feeling bars may soften in third quarter because of an anticipated dip in auto needs.

PLATE AND STRUCTURALS...
Production of badly needed shapes was hampered in Pittsburgh by a one-day wildcat strike at a large mill.
In Chicago, market is extremely tight and getting tighter as unexpected volume of refinery building is added to burden. Some buyers reported of-

### **Purchasing Agent's Checklist**

WAREHOUSE STEEL: New color coding system helps consumer. p. 55 SCREW PRODUCTS: How to cut costs for better results....p. 56

NONFERROUS: Pricing .... p. 60

fering to buy ingot for conversion to plate at \$20 over market price. Some structural fabricators three weeks behind schedule, with carry-overs of 45 days and up. Demand has not eased in Detroit, either. Third quarter booked solid and some sellers could continue booking into the middle of 1957. West Coast mills are sold out through the summer, with the market tighter than in many months.

STAINLESS . . . In Pittsburgh, Crucible Steel Co., announced new extras to cover the cost of heat treating stainless steel bars and wire. They vary from  $3\frac{1}{2}$  to  $12\frac{1}{2}$ ¢ a lb. on wire rods, and  $3\frac{1}{2}$ ¢ to  $9\frac{1}{2}$ ¢ on bars, depending on size and hardness.

WAREHOUSES . . . Bars and cold rolled sheets in Pittsburgh are easier to come by, but structurals and plate are as tight as ever. In Chicago, the inventory situation looking toward fall doesn't appear too good. Bar inventories are picking up slightly in cold finished, but continue bad in hot rolled bar and continue shrinking in structurals, large rounds and plate. Detroit flat rolled business isn't too good, but some out side manufacturers are coming into the area for sheet.

PIPE AND TUBING . . . Tubular market in Chicago getting tighter with seasonal upswing in oil field orders. Oil country purchasing agents continuing futile search for conversion tubing. In Pittsburgh, Jones & Laughlin announces price increases on the following grades of seamless tubular products: seamless standard weight, extra strong and double extra strong line pipe, large outside diameter pipe 50¢ to \$6.50 per ton; seamless oilwell casing \$4.50 to \$25 per ton; seamless oilwell tubing \$5.50 to \$6.75 per ton; seamless drill pipe \$12 to \$30 per ton.

TINPLATE . . . Pittsburgh producers came out of April with low inventories and shipments continuing at high rate. Outlook is for third quarter to be about 85-90 pct of first half rate. Consumers loading up for a possible steel strike. In Chicago, another record year is expected with can companies booking very strongly for third quarter. A survey by a Jones & Laughlin Steel Corp., predicts demand for tin products is expected to approach the 7½-million ton mark by 1960—an increase of more than 30 percent above 1954.

### Comparison of Prices

(Effective May 8, 1956)

.85 .55 .10 .65¢ .90 .65 .60¢ .725 .65 .50 .50 .50 .50 .50 .50 .50 .50 .50 .5	\$9.45* 8.15* 8.70* 4.65# 5.90 5.65 4.60 88.28 5.11.50 6.60¢ 84.725 5.65 \$4.80 96.00	888 5 4 888 111 66 68 68 68 68	.45° .15° .70° .65¢ .90 .85 .85 .80 .25 .50 .60¢ .50 .50 .50 .50	\$9.05 7.75 7.35 4.30 5.40 5.40 4.25 85.50 10.40 5.75 84.45 5.85 5.86 4.00 74.00 86.00 86.00
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.55 .10 .65¢ .90 .65 .60 .25 .50	8.15° 8.70° 4.65¢ 5.90 5.65 4.60 88.25 11.50 6.60¢ \$4.725 5.65	88 88 88 88 88 88 88 88 88 88 88 88 88	.55¢ .90 .65 .50 .50 .50 .50	7.75 7.35 4.30 5.40 5.07 4.25 35.50 10.40 5.75 \$4.48 5.35
.55 .10 .65¢ .90 .65 .60 .25 .50	8.15° 8.70° 4.65¢ 5.90 5.65 4.60 88.25 11.50 6.60¢ \$4.725 5.65	88 88 88 88 88 88 88 88 88 88 88 88 88	.55¢ .90 .65 .50 .50 .50 .50	7.75 7.35 4.30 5.40 5.07 4.25 35.50 10.40 5.75 \$4.48 5.35
.55 .10 .65¢ .90 .65 .60 .25 .50	8.15* 8.70* 4.65* 5.90 5.65 4.60 88.25 6.60¢ 44.725 5.65	88 88 88 88 88 88 88 88 88 88 88 88 88	.15° .70° .65¢ .90 .65 .60¢ .50	7.75 7.35 4.30 5.40 5.07 4.25 85.50 10.40 8.75 84.48 5.35
.55 .10 .65¢ .90 .65 .60 .25 .50	8.15* 8.70* 4.65* 5.90 5.65 4.60 88.28 11.60 6.60¢ 84.725 5.65	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	.15° .70° .65¢ .60° .25 .50	7.75 7.38 4.30 5.40 5.40 4.25 85.50 10.40 8.75 84.48 8.38
.55 .10 .65¢ .90 .65 .60 .25 .50	8.15* 8.70* 4.65¢ 5.65 4.60 88.25 11.60 6.60¢ 84.725 5.65	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	.15° .70° .65¢ .90 .65 .60 .25 .50	7.75 7.38 4.30 5.40 5.40 4.25 85.50 10.40 8.75
.55 .10 .65¢ .90 .65 .60 .25 .50	8.15* 8.70* 4.65¢ 5.65 4.60 88.25 11.60 6.60¢ 84.725 5.65	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	.15° .70° .65¢ .90 .65 .60 .25 .50	7.75 7.38 4.30 5.40 5.40 4.25 85.50 10.40 8.75
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.55 .10 .65¢ .90 .65 .60 .25	8.15* 8.70* 4.654 5.90 5.65 4.60 38.25 11.50	8 8 8 8 8 11	.15° .70° .65¢ .90 .65 .60	7.75 7.88 4.30 5.40 5.07 4.25 35.50 10.40
.55 .10 .65¢ .90 .65 .60 .25	8.15* 8.70* 4.654 5.90 5.65 4.60 38.25 11.50	8 8 8 8 8 11	.15° .70° .65¢ .90 .65 .60	7.75 7.88 4.30 5.40 5.07 4.25 35.50 10.40
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.55 .10 .65¢ .90	8.15° 8.70° 4.65¢ 5.90 5.65	8 8	.15° .70°	7.75 7.85 4.30 5.40 5.07
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.55 .10	8.15° 8.70°	8	.70*	7.75 7.85
.55 .10	8.15° 8.70°	8	.70*	7.75 7.85
.55	8.15° 8.70°	8	.70*	7.75
.55	8.15*	8	.15*	7.75
.55	8.15*	8	.15*	7.75
.55	8.15*	8	.15*	7.75
.50	44.50	44	.50	41.50
.40	10.40		.40	9.30
.52	4.52		.52	4.22
.28	6.28		.28	5.79
.825	4.325		.825	4.05
.86	5.85		.85	5.45
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	ay 8	May 1 1956	Apr. 10 1956	May 10 1955
Foundry Valley Foundry, Southern Cin'ti Foundry, Birmingham Foundry, Chicago Basic de'l Philadelphia Basic, Valley furnace Malleable, Chicago	85.26 80.50 62.93 55.90 60.50 64.48 80.00 60.50 9.50 \$	\$65.26 60.50 62.98 \$5.00 60.50 64.48 60.00 60.50 \$0.50 9.50\$	\$65.25 50.50 52.98 55.00 50.50 64.43 60.50 60.50 9.50¢	\$61.19 56.50 60.48 52.88 56.50 60.27 56.00 56.50 9.50#
Pig Iron Composite: (per gross ton Pig iron \$		\$60.29	\$60.29	\$56.59
Scrap: (per gross ton)		05450	\$55.50	\$34.50
No. 1 steel, Pittsburgh \$	5.50	\$54.50 56.50	54.50	36.00
	2.50	54.00	54.50	33.50
	9.50	51.50	55.50	27.50
	9.50	61.50	61.50	35.50
	7.50	58.50	58.50	43.50
	86,60	1.6.50	66.50	44.50
	4.50	56.50	57.50	46.50
Steel Scrap Composite: (per gross No. 1 heavy melting scrap \$		\$55.00	\$54.83	\$34.67
Coke, Connellsville: (per net ton at Furnace coke, prompt		\$14.50	814.25	\$13.00
	17.50	17.50	16.25	16.75
Nonferrous Metals: (cents per pour		ge buyer		
Copper, electrolytic, Conn \$		\$46.00	\$46.00	\$36.00
	46,00	46.00	46.00	36.00
Tin, Straits, New York	97.875†	98.375	99.50	91.125
	18.80	18.50	18.50	12.00
	15.80	15.80	25.90	14.80 23.20
	25.90	28.90	54.50	67.67
	84.80 24.50	84.50	88.25	29.25
	83.00	33.00	\$8.00	28.50
Antimony, Larent, 141	99.04	50.00	86.44	20.00

† Tentative. ‡ Average. \*Revised.

Steel Scrap Composite

Average of No. 1 heavy meiting steel acray delivered to consumers at Pittaburgh, Philadelphia and Chicago.

Finished Steel Composite

Weighted index based on steel bars, shapes, slates, wire, rails, black pipe, hot and cold colled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Phila-delphia, Buffalo, Valley and Birmingham.

PIG IRON

Dellars per gross ten, f.e.b., subject to switching charges.

### STAINLESS STEEL

Base price conts per lb. f.s.b. mill.

← To identify producers, see Key on P. 158→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem B3	62.00	62.50	63.00	63.50	
Birdabero, Pa. Bi		62.50	63.00	63.50	
Birmingham R3.	54.50	55.00*	******		
Birmingham W9.	54.50	55.00°	59.00		
Bufalo R3	54.50	55.00°	59.00		
Buffalo R3		60.50	61.00	61.50	
Buffalo H1	60.00	60.50	61.00		
Buffalo W6	60.00	60.50	61.00	61.50	
Chester C/7		62.58	63.00		
Chicago I4		60.50	60.50	61.00	
Cleveland A5		60.50	60.50	61.00	65.00
Cleveland R3		60.50	60.50	61.00	*****
Duluth I4		60.50	60.50	61.00	65.00
Erio 14	60.00	60.50	60.50	61.00	65.88
Everett M6		62.50	63.00		
Fentana KI	67.50	68.80	******		*****
Geneva, Utah C7		60.50		*****	
Granite City G2.	61.90	62.40	62.90		
Hubbard YI			60.50		
Lane Star L3		\$5.00	******		
Midland C//		******	******		
Minnequa Co		62.50	63.00		
Monessen P6			******	******	
Naville Is. P4	60.00	68.50	60.50	61.00	65.04
N. Tenawanda 7		60.50	61.00	61.50	
Pittsburgh UI	60.00		60.50	61.00	
Sharpaville S3	. 60.00	68.58	60.50	61.00	
So. Chicago R3	60.00		60.50		
Steelton B3	. 62.00	62.50	63.00	63.50	68.00
Swedeland A2		62.50	63.00	63.50	
Tolodo /4	. 60.00	60.50	60.50	61.00	
Troy, N. T. R3		62.50	63.00	63.50	68.86
foungstown Y1.			60.50	61.00	

DIFFERENTIALS: Add, 50¢ per tem for each 0.25 pct ellicon or portion thereof over hase (1.75 to 2.25 pct except law phose, 1.75 to 2.00 pct) 50¢ per tem for each 0.50 pct management or portion thereof over 1 pct, 32 per tem for 8.5 to 0.75 pct nickel, 31 for each additional, 0.25 pct nickel, 34 for each additional, 0.25 pct nickel, 34 for each additional, 0.25 pct nickel, 58 pct place, 1 intermediate low phose. Silvery Iron Buffalo, III, 388.75; Jackson, II, GI, 387.50. Add 31.25 per tem for each 0.50 pct silicon over hase (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 8.50 pct management over 1.0 pct. Bessemer ferresilicon prices are \$1 over comparable silvery iron.

Product	301	302	393	304	316	321	348	419	416	436
Ingets, rerelling	17.75	19.00	-	20.25	31.50	25.00	33.75	15.00	-	15.25
Slabs, billets, rerolling	22.25	24.75	26.75	25.00	49.25	32.00	43.00	19.50	-	19.70
Forg. discs, die blocks, rings	-	-	-	-	-	-	-	-	-	-
Billets, forging	31.75	32.00	34.75	33.75	51.25	28.25	51.00	25.50	26,00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	80.75	45.25	68.00	39.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.25	32.25
Sheets	44.25	44.50	52.25	47.25	68,25	54.25	73.50	36.25	-	36.71
Strip, hat-ralled	32.00	34.50	-	37.25	58.25	44.25	50.75	-	-	-
Strip, cold-rolled	41.00	44.50	-	47.25	88.25	54.25	73.50	36.25	-	36.7

### STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., CII; Brackenridge, Pa., A3; Buther, Pa., A7; McKeespert, Pa., UI; Washington, Pa., W2, (2.23¢ lower on Type 430) J2; Baltimore, EI; Middletown, O., AI; Massillon, O., R3; Cary, UI; Bridgeville, Pa., U2; New Castla. Ind., I2; Ft. Wayne, J4; Philadelphia. D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKossport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detreit, M2; Cantas-Massillan, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Comm., U3 (.25¢ per lb higher); W1 (.25¢ per lb higher); New Bedford, Mass., &6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Randing, Pa., C2; Titusville, Pa., U2; Washington, Pa., 12; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillan, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, 14; Philadelphia, D5; Detrait, R5.

Wire: Waukegan, A5; Massillon, O., R3; McKoospert, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A1; Dunkirk, A3; Monsson, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicaga, Ill., J4; Watervillet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., 43; Chicago, UI; Munhall, Pa., UI; Midland, Pa., CII; New Caste, Ind., 12; Middletown, 47; Washington, Pa., 12; Cleveland, Massillon, R3; Castevrille, Pa., CI5; Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Forndale, Mich., A3; Washington, Pa., J2.

Forgings billsts: Midland, Pa., Cl1; Baltimore, Al; Washington, Pa., J2; McKnesport, F1; Massillon, Canton. O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, Cl1; Detroit, R5.

### Mills Resist, Prices Skid

Market registers significant decline in most areas . . . Mill resistance only part of story of decline in prices . . . Export still strong, inventories not high.

◆ PRICES in major consuming areas dropped from \$1 to \$3 for steelmaking grades, sending THE IRON AGE composite price down \$1.83 for the most significant decline in weeks.

A number of factors were behind the price slump, including (1) mill resistance, (2) talk of export controls in Washington, and (3) some apprehension of a steel strike which might lead dealers to weaken before mill efforts to bring prices down.

It is not coincidence that in virtually every case when scrap export control talk becomes loudest in Washington, it is followed by a drop in scrap prices.

With openhearth grades bringing over \$50 in most markets, mill inventories at far from a comfortable level, and export demand strong at most ports, the market retains its underlying strength. But this may not prevent further declines.

In Washington, controversy between the steel industry and scrap trade reached the Senate, but it appears that there is little possibility of any congressional action to limit shipments abroad.

Robert W. Wolcott, chairman of the board of Lukens Steel Co., is repeating earlier requests that restrictions be placed on exports. Previously, similar testimony before the House Banking Committee and the Commerce Dept. failed to bring administrative action.

THE IRON AGE composite price is \$53.17, down from \$55.00.

Pittsburgh . . . Prices of most grades dropped this week as lack of heavy mill buying continues to weaken the market. No. 1 heavy melting was pegged at \$52 by the purchase of an area mill. No. 2 grades

held at \$45 for heavy melting and \$43 for bundles. Same mill paid \$1 higher for these grades, but broker and other mill quotations do not support higher prices. Turnings are off \$3; low phos, heavy turnings and cast grades are down \$1 to \$2.

Chicago . . . Though mill offers to buy at as low as \$51 for No. 1 heavy melting were generally refused at press time, the market had slipped considerably following very weak mill buying the previous week. New mill orders were in low tonnages and this, coupled with offers to buy at futher reducations from other mills in the area, as well as reports of reduced prices for material that had been moving to other areas, forced the Chicago market into a slide.

Philadelphia . . . Although there were no major transactions in steel-making grades this week, broker willingness to sell indicates these grades are off \$1. While none of the mills in the area seem to have built up anything resembling a substantial inventory, they are in a better position than they had been and are exhibiting more caution. However, demand can still be considered good, although shipments are off slightly.

New York . . . Steelmaking grade prices have fallen here in sympathy with those in consuming areas. New prices reflect high volume of scrap now filling pipelines. Top price is now \$48 for No. 1 heavy melting. Turnings prices are the subject of some dispute, but in view of the declining market, shoveling turnings are quoted at \$31 tops, a decline of \$1. Exports continue a strong factor in this market, with no less than seven ships reported booked last week for scrap cargoes for the period May to July. Cast continues strong.

Detroit . . . Prices continued to decline this week as the latest mill purchase was made on a \$50 f.o.b. basis for No. 1 grades. No. 2 heavy melting and No. 2 bundles also dropped. Indications are that the market has not leveled off and may be in for additional drops in the next few weeks.

Cieveland . . . Prices dropped an other \$2 in Cleveland and \$1 in sympathy in the Valley when a Cleveland mill purchased No. 1 heavy melting for \$55. Early in the week a mill on fringes of the Valley district also purchased electric furnace scrap for \$60, or \$2 under previous quotation. A local automotive foundry also purchased an unquoted grade of cut auto scrap for \$54 for which brokers are paying as low as \$51. Because of drop in export demand, some scrap is coming into Valley area from New England by rail.

Birmingham . . . Nearby openhearth consumers have purchased No. 2 heavy melting steel scrap in limited quantities on a basis of \$40 per gross ton, delivered mills. This makes the price in Birmingham \$38 as presently quoted. The market is generally quiet but strong at present prices, with electric furnace grades still bringing high prices.

St. Louis . . . As a means of cutting down shipments of scrap which had sharply increased to exceed the melt, steel mills reduced prices on most items \$2.50 per ton. The market generally is weaker and it is expected this will result in lower prices for railroad material when the next lists of the rail companies are sold.

Cincinnati . . . Market remained slow with routine shipments against old orders on fringe of district. Upriver activity is nil due to lethargy in Pittsburgh market. Foundries slowed to a walk with most carrying high inventories of rails and cast iron.

Buffalo... The area's biggest consumer came into the market for No. 1 and 2 heavy melting and No. 2 bundles at quoted prices. Prices appear to be fairly stable, with the trade neither bullish nor bearish.

Boston . . . No. 1 grades dropped \$3 in an inactive market. Most customers are out of the market and the situation is somewhat confused. Secondary openhearth grades as well as blast furnace also dropped.

West Coast . . . Scrap is moving to mills in good volume following recent price hikes in California. Seattle prices also moved up.

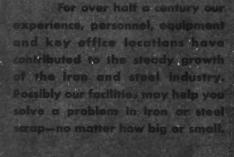


### Leaders in Iron & Steel Scrap Since 1889













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### Pittsburgh

No. 1 hvy. melting\$	51.00	to	\$52.00
No. 2 hvy. meiun	51.00	to	52.00
No. 2 bundles	42.00		
Machine shop turn	35.00		
Mixed bor. and ms. turn	35.00		
Shoveling turnings	40.00		
Cast iron borings	40.00	to	41.00
Low phos. punch'gs plate	61.00	to	62.00
Heavy turnings	51.00	to	52.00
No. 1 RR hvy. melting	61.00		
Scrap rails, random lgth	66.00		
Rails 2 ft and under	72.00		
RR. steel wheels	64.00		
RR. spring steel	64.00		
RR. couplers and knuckles	64.00		
No. 1 machinery cast	57.00		
Cupola cast			
Heavy breakable cast	49.00	to	50.00

### Chicago

No. 1 hvy. melting\$		
No. 2 hvy. melting	42.00 to	43.00
No. 1 factory bundles	55.00 to	56.00
No. 1 dealers' bundles	51.00 to	52.00
No. 2 dealers' bundles	37.00 to	39.00
Machine shop turn	29.00 to	30,00
Mixed bor, and turn	31.00 to	32,00
Shoveling turnings	31.00 to	32.00
Cast fron borings	31.00 to	32.00
Low phos. forge crops	61.00 to	62.00
Low phos. punch'gs plate	58.00 to	59.00
Low phos. 3 ft and under	56.00 to	57.00
No. 1 RR. hvy. melting	57.00 to	58.00
Scrap rails, random lght	65.00 to	67.00
Rerolling rails	73.00 to	
Rails 2 ft and under	72.00 to	73.00
Locomotive tires, cut	62.00 to	63.00
Cut bolsters & side frames	62.00 to	63,00
Angles and splice bars	68.00 to	
RR. steel car axles	71,00 to	
RR. couplers and knuckles	61.00 to	
No. 1 machine cast	54.00 to	
Cupola cast	50,00 to	
Heavy breakable cast	44,00 to	
Cast iron brake shoes	42.00 to	
Cast iron car wheels	54.00 to	
Malleable	63.00 to	
Stove plate	44.00 to	
Steel car wheels	60.00 to	

### Philadelphia Area

C COLORES OF THE COLOR OF THE COLO		
No. 1 hvy. melting\$	55.00 to	\$56.00
No. 2 hvy. melting	46,00 to	
No. 1 bundles	55.00 to	57.00
No. 2 bundles	44.00 to	
Machine shop turn	87.00 L	0 35.00
Mixed bor. short turn	38.00 to	
Cast iron borings	41.00 to	
Shoveling turnings	41.00 t	
Clean cast chem, borings	48 50 to	
Low phos. 5 ft and under	57.00 t	
Low phos. 2 ft and under	58.00 t	
Low phos. punch'gs		
Dies france punch gs	58.00 t	
Elec. furnace bundles	06.00 L	
Heavy turnings	51.00 t	
RR. steel wheels	61.00 t	
RR. spring steel	62.00 t	
Rails 18 in. and under	67.00 L	0 68.40
Cupola cast	50 00 t	0 52 00
Heavy breakable cast	53.00 t	0 54 00
Cast iron car wheels	58.50 E	
Malleable	69.00 1	
Unstripped motor blocks	38 00 1	
No. 1 machinery cast.	65 00 1	
	25.05 41.41. 4	

### Cleveland

No. 1 hvy. melting	54.00	to	\$55.00
No. 2 hvy. melting	46.00		47.00
No. 1 bundles	54.00		
No. 2 bundles	39.00		
No. 1 busheling	54.00		
Machine shop turn	\$2.00		
Mixed bor. and turn	36.00		
Shoveling turnings	36.00		
Cast iron borings	36.00		37.00
Cut struct'r'l & plates. ? fr	00.00	147	01.00
& under	58.00	80	59.00
Drop forge flashings	54.00		
Low phos. punch'gs, plate.	55.00		
Foundry steel, 2 ft & under.			
No. 1 RR. heavy melting	60.00		
Rails 2 ft and under			
Rails 18 in. and under	74.00		
Railroad grate bars	41.00		
Steel axle turnings	39.00	to	40.00
Railroad cast	57.00	to	58.00
No. 1 machinery cast	56.00	to	57.00
Stove plate	52.00	to	
Malleable	60.00	to	

### Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Youngstown

No. 1 hvy, melting	\$57.00 to \$58.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 bundles	57.00 to 58.00
No. 2 bundles	40.00 to 41.00
Machine shop turn	32.00 to 33.00
Shoveling turnings	37.00 to 38.00
Cast fron borings	37.00 to 38.00
Low phos. plate	59.00 to 60.00

### Buffalo

No. 1 hvy. melting	54.00	to	\$55.00
No. 2 hvy. melting	42.00	to	43.00
No. 1 busheling	54.00	to	55.00
No. 1 bundles	54.00	to	55.00
No. 2 bundles	38.00	to	39.00
Machine shop turn	29.00	10	30.00
Mixed bor, and turn	30.00	to	31.00
Shoveling turnings	31.00	to	32.00
Cast iron borings	31.00	to	32.00
Low phos. plate	57.00	to	58.00
Scrap rails, random lgth	60.00	to	61.00
Ralls 2 ft and under	70.00		
RR. steel wheels	60.00		
RR. spring steel	60.00	to	61.00
RR. couplers and knuckles	60.00		
No. 1 machinery cast	53.00		
No. 1 cupola cast	50.00		51.00

### Detroit

Brokers buying prices per gros	s ton,	en	CRES:
No. 1 hvy, melting	49.00	to \$	50.00
No. 2 hvy. melting			40.00
No. 1 bundles, openhearth	49.00	to	50.00
No. 2 bundles	32.00	to	33.00
New busheling			50.00
Drop forge flashings	48.50	to	49.50
			25.00
Mixed bor. and turn	27.00	to	28.00
Shoveling turnings	27.00	to	28.00
Cast iron borings	27.00	to	28.00
Low phos. punch'gs, plate.	49.00	to	50.00
No. 1 cupola cast	46.00	to	47.00
Heavy breakable cast	39.00	to	40.00
Stove plate	40.00	to	41.00
Automotive cast	50.00	to	51.00

### St. Louis

JI. EVUIS			
No. 1 hvy. melting	42.50	to	\$43.5
No. 2 hvy. melting	40.00	to	41.0
No. 1 bundles	45.50	to	46.5
No. 2 bundles	36.00	to	37.0
Machine shop turn	27.00	to	28.0
Cast iron borings	29.00	to	30.0
Shoveling turnings	29.00	to	30.0
No. 1 RR. hvy. melting	57.00	to	58.0
Rails, random lengths	60.00	to	61.0
Rails 18 in, and under	67.00	10	68.0
Locomotive tires uncut	57.00	to	58.0
Angles and splice bars	58.00	10	59.0
Std. steel car axles	55.00	to	56.0
RR *pecialties	58 00	to	59.0
Cupola cast	50.00	to	51.0
Heavy breakable cast	39.00	to	
Cast iron brake shoes	42.00		
Stove plate	42,00	to	43.0
Cast iron car wheels	57.00		
Rerolling rails	73.00		
Mallenble			
Unstripped motor blocks	39.00		

	031011			
B	okers buying prices per gre	ss ton,	on	CHTS:
N	o. 1 hvy. melting	\$43,00	to \$	44.00
N	o. 2 hvy. melting	33.50	to	34.50
	o. 1 bundles			
N	o. 2 bundles	32.50	to	33.50
N	o. 1 busheling	46,00	to	47,36
E	lec. furnace, 3 ft & under	45.00	to	46.00
M	achine shop turn	26.00	to	26.50
M	ixed bor, and short turn.	27.00	to	28.00
S	noveling turnings	30.00	to	30.50
C	lean cast chem. borings	31.00	to	32.00
N	o. 1 machinery cast	45,50	to	46,00
M	ixed cupola cast	40.00	to	41.00
H	eavy breakable cast	42.50	to	43.01
	ove plate		to	40,00
U	nstripped motor blocks	25.50	to	26.00

### New York

14041 14111		
Brokers buying prices per gross ton.	en	CRES
No. 1 hvy. melting\$47.00	to \$	48.00
No. 2 hvy. melting 38.00	to	39.00
No. 2 bundles 36.00		37.00
Machine shop turn 26.00		27.00
Mixed bor. and turn 26.00		27.00
Shoveling turnings 30.00		31.00
Clean cast chem. borings 32.00		33.00
No. 1 machinery cast 49.00		50.00
Mixed yard cast 46.00		47.00
Charging box cast 46.00		47.00
Heavy breakable cast 46.00		47.00
Unstripped motor blocks 33.00	to	34.00

### Birmingham

No. 1 hvy. melting\$	39.00	to	\$40.00
No. 2 hvy. melting	37.00	to	38.00
No. 1 bundles	39.00	te	40,00
No. 2 bundles	31.00	to	32.00
No. 1 busheling	29.00	to	40.00
Machine shop turn	31.00	to	32.00
Shoveling turnings	32.00		
Cast iron borings	21.50		
Electric furnace bundles	44.00	to	45.00
Bar crops and plates	52.00	to	53.00
Structural and plate, 2 ft .	51.00	to	52.00
No. 1 RR. hvy. melting	50.00	to	51.00
Scrap rails, random lgth	60.00	to	61.00
Rails, 18 in. and under	63.00	to	64.00
Angles & splice bars	59.00	to	60.00
Rerolling rails	65.00	to	66.00
No. 1 cupola cast	47.50	to	48.50
Stove plate	46.00	to	47.00
Charging box cast	32.00	to	33.00
Cast iron car wheels	39.00	to	40.00
Unstripped motor blocks	37.00	to	38.00
Mashed tin cans	15.00	to	16.00

### Cincinnati

Brokers buying prices per gros	s ton.	en	cars:
No. 1 hvy. melting\$	52.00	to \$	53.00
No. 2 hvy. melting	41.00	to	42.00
No. 1 bundles	52.00	to	53.00
No. 2 bundles	38.00	to	39.90
Machine shop turn	31.00	to	32.00
Mixed bor, and turn	31.50	to	32.50
Shoveling turnings	34.50	to	35.50
Cast iron borings	31.50	to	32.50
Low phos. 18 in. & under	58.00		59.00
Rails, random lengths	62.00	to	63.00
Rails, 18 in. and under	70.00		71.00
No. 1 cupola cast	49.00	to	50.00
Hvy. breakable cast	47.00	to	48.00
Drop broken cast	58.00	to	59.00

### San Francisco

No. 1																		\$40.
No. 2	hvy.	me	lti	n	g		•	4	,									37.
No. 1															,			39.
No. 2	bune	iles													×		*	32.
No. 3	bune	lies									*							26.
Machi	ne sl	nop	tı	11	T	ı.					×	*	*		,	ų.	-	21.
Cast	iron	bor	in	g	8													22.
No. 1	RR.	hvy	7.	r	n	el	it	Ð	n	g				*				40.
No. 1	cupo	ola (	ca	8	t.													48.

### Los Angeles

No. 1 hvy. melting	 \$41.
No. 2 hvy. melting	 37.
No. 1 bundles	 40.
No. 2 bundles	 30.
No. 3 bundles	 26.
Machine shop turn	 21.
Shoveling turnings	 24.
Cast iron borings	 21.
Elec. furn. 1 ft and under	 41.
No. 1 RR. hvy. melting	 41.
No. 1 cupola cast	 46.

### Seattle

No. 1 hvy. melting							4	*			\$46.00
No. 2 hvy. melting		×						*			42.00 33.00
No. 2 bundles	*		•	-	-						31.00
No. I cupola cast.			0		0						45.06
Mixed yard cast.		•	0	0	0	۰	0	0			45.00

### Hamilton, Ont.

\$50.50
46.50
50.50
42.00
44.50
40.50
48.50
44.50
23.00
27.50
24.00
58.50
50.00



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President

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### **Next Headache For Copper**

Despite favorable foreign developments copper situation is not out of the woods yet . . . Domestic labor situation looms as big "if" . . . Current union being challenged.

♦ IN ALL of the recent pricing activity in copper, domestic producers' metal has been the most stable. London Metals Exchange prices have been sliding. Custom smelters are now below U. S. producers' price. Anaconda was forced to prop up price of Chilean copper sold in U. S. Rhodesian interests dropped their price. And even Belgian copper price declined.

Because of this, most fabricators have been watching world development closely, while exhibiting only a passing interest in the domestic scene. And now that foreign prices are going their way, many are expecting a better supply outlook. But the copper situation is not out of the woods yet. And the trouble spot is right here on the home front.

There may be labor trouble this summer and there isn't much copper management can do about it. The independent Mine, Mill and Smelter Workers Union now represents a majority of the workers in the industry. It will be challenged by United Steelworkers (AFL-CIO).

This is nothing new, but in 1956 MMSW is in the weakest position it has been in years. The U. S. Justice Dept. has branded it as leftwing, and Maurice E. Travis,

former president of the union, has been convicted of perjury for swearing he wasn't a Communist. It will be a real scrap, and unless one side or the other wins a clear cut victory there could be sporadic difficulties, cutting into production for the rest of the year.

Mine, Mill and Smelters will make their stand at the bargaining tables beginning in June. Indications are that the key demand will be hourly wage boosts averaging 20¢. This figure was arrived at with one eye on expected USW slate for negotiations with the basic steel industry. They expect USW to ask for more but to compromise on less. MMSW insists that it will stand its ground on 20¢.

If MMSW gets what it asks for with no obvious compromises, this will go far in taking USW pressure off. If, however, management takes an equally solid stand at a lower figure, there could be a repetition of the crippling strikes of 1955. And this would be the signal for increased USW campaigning which certainly won't help immediate production.

There is no doubt that things look better than they did for copper fabricators, but they won't look really good until labor matters are resolved. NICKEL . . . Major expansion of the nickel-refining industry, backed by substantial government assistance, is in the works.

Projected program, now being drafted by the Office of Defense Mobilization, will involve the two pilot processing plants in Cuba now operated by Bethlehem Steel and by Freeport Sulfur.

Among the types of financial assistance that are being discussed are (1) the setting up of a premium-price plan, (2) a floor price plan, (3) a guaranteed loan program, and (4) fast tax amortization. Any one or all of these avenues of assistance may be employed. Formal announcement of the new assistance program is expected soon.

Some congressmen are openly irritated at the current nickel shortage, and are asking the ODM if return to rigid controls over the enduses of nickel is not both desirable and necessary.

Dr. Arthur S. Flemming, director of ODM, has been telling Congress that the problem of shortages of nickel can only properly be solved by increasing the sources of supply, not by regulating end-uses of nickel or by making these tougher for consumers of nickel.

The nickel shortage has grown particularly tight in recent weeks. The Defense Department has sharply increased its demands for nickel. This means that firms holding defense orders are now eligible to buy more nickel. Firms not holding defense contracts have to scramble around for what's left — and at premium prices.

Government stockpiling of nickel has been moving along at a steady rate, notwithstanding the stepped-up demands. The overall stockpile position on nickel is considered to be "good," but the tonnage goal is by no means fully accomplished.

TIN . . . Situation is relatively stable, with one possibility of a fly in the ointment. Market is generally easier with a favorable firmness. Consensus of opinion on the threatened dock strike at Penang is optimistic. It is expected that the situation will be settled without a work stoppage.

However, there has been no official word and negotiations must begin before midnight Sunday or the union has promised to strike. If a strike does occur, it will be serious since dock workers at other ports have indicated that they won't handle ships diverted from the struck locale.

### **Daily Nonferrous Metal Prices**

(Cents per 1b except as noted)

	May 2	May 3	May 4	May 5	May 7	May 8
Copper, electro, Conn.	46.00	46.00	46.00	46.00	46.00	46.00
Copper, Lake, delivered	46.00	46.00	46.00	46.00	46.00	46.00
Tin, Straits, New York	98.00	97.75	97.625		97.625	97.875*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.

\*Tentative

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### MILL PRODUCTS

(Cents per lb, unless otherwise noted)

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed) Flat Sheet (Mill Finish) and Plate ("F" temper except 6061-0)

Alloy	.032	.081	.136-	3.		
1100, 3003	42.3	40.2	39.0	38.0		
8052	49.8	44.9	43.2	41.4		
6061-0	46.9	42.7	40.9	49.8		

### **Extruded Solid Shapes**

Factor	6063 T-5	6062 T-6
6-8	43.1-44.8 43.8-45.2	58.1-61.7 59.0-63.3
12-14 24-26	46.8-47.2	69.2-73.6
86-38		92.0-95.8

### Screw Machine Stock-2011-T-3

Size"	34	36-36	%-1	134-136			
Price	56.0	54.9	53.6	51.6			

### Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144		
.010 gage	\$1.310	\$1.742	\$2.175	\$2,685		
.024 gage	1.630	2.177	2.707	3.247		

### MAGNESIUM

(1.o.b. shipping pt., carload frt. allowed) Sheet and Plate

Type → Gage→	.250- 3.00	.250- 2.00	.188	.081	.032
FS1 Stand. Grade		65.6	66.5	75	100
FS1 Spec.		88.9	91.1	103.5	163.1
Tread Plate		67.8	68.9		
Tooling Plate	70.2				

### Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade	66.4-	67.5-	72.1-	84.9-
(FS)	69.0	69.6	72.7	85.8
Spec. Grade	81.4-	82.5-	87.1-	99.9-
(AZ31B)	84.0	84.6	87.7	100.8

### Alloy Ingot

A WO1D /	Die Casting)	95 (deliment)
WWA.112 ()	DIC CHIMINET	On (menacient)
ATTOOA	AZ92A, AZ91C (Sand Casting)	90 05 / W-lanes Wen h

### NICKEL, MONEL, INCONEL

(Base prices, f.	0.b. mill)	
"A" Nickel	Monel	Incone
Sheet, CR 102	83	9.9
Strip, CR 102	92	125
Rod, Bar, HR 87	74	93
Angles, HR 87	74	93
Plate, HR 97	87	95
Seamless tube, 122	110	153
Shot Blocks	71	

### COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	68.63			68.82
Brass, 70/30	56.60	57.14		59.51
Brus, Low	61.35	61.89	61.29	64.16
Bram, R L	63.07	63.61	63.01	65.88
Bram, Naval	59.80	65.06	54.11	62,96
Munts Metal	57.84	51.85	53.65	
Comm. Bs.	65.33	65.87	65.27	67.89
Mang. Bs.	63.54	66.19	57.64	
Phos. Bs. 5%	86.79	84.44	87.29	

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$13.10\$13.60; alloy \$15.26-\$16.75; Plate, HR, commercially pure, \$10.50-\$11.00; alloy, \$11.50\$12.00. Wire, rolled and/or drawn, commercially pure, \$5.0-\$11.50; alloy, \$11.50; Bar, HR
or forged, commercially pure, \$7.90-\$8.15; alloy,
\$7.90-\$8.10.

### PRIMARY METAL

FRIMARI MEIAL
(Cents per lb, unless otherwise noted)
Aluminum ingot, 99+%, 10,000 lb.
freight allowed 25.90
Aluminum nie 94 00
Aluminum pig 24.00 Antimony, American, Laredo, Tex. 33.50
Paralliana American, Laredo, 1ex. 33.50
Beryllium copper, per lb conta'd Be \$43.00
Beryllium aluminum 5% Be, Dollars
per lb contained Be\$74.75
Bismuth, ton lots 2.25
Cadmium, del'd \$ 1.70
Cobalt, 97-99% (per lb)\$2.60 to \$2.67
Copper, electro, Conn. Valley 46.00
Copper, Lake, delivered 46.00
Gold, U. S. Treas., per troy oz\$35.00
Indium, 99.9% dollars per troy oz. \$ 2.25
Iridium, dollars per troy oz \$100 to \$120
Lead, St. Louis
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco,
Tex., 10,000 lb, pig
ingot 94 50
ingot
Marguesium, sticks, 100 to 500 ib 56.00
Mercury, dollars per 76-lb flask,
f.o.b. New York\$268 to \$270
Nickel electro 64.50
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. \$23 to \$24
Platinum, dollars per troy oz. \$97 to \$107
Silver, New York, cents per troy oz. 90.75
Tin, New York
Titanium sponge, grade A-1\$ 3.45
Zinc, East St. Louis 13.50
Zinc, East St. Louis
Zirconium sponge\$10.00
*Tentative

### REMELTED METALS

Brass Ingot

(C	ènte	p	e	,		ĩ	b		d	e	14	t	e	r	e	đ	4	06	31	ri	lo	ad	la)
85-5-5-	-5 in	ge	21	t																			
No.	115	-									į.												40.50
No.	120														×				*				39.50
	123									i										į.			38.50
80-10-	10 in	g	01	t																			
No.	305							٠.															43.75
No.																							42.00
88-10-	2 ins	O	t																				
No.	210																						55.7
No.	215																						52.0
No.	245																						46.7
Yellow	r ing	to	t																				
No.	405																						31.7
Manga	nes	e 1	01	N	01	n	z	8															
No.	421																						36.2

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)
95-5 aluminum-silicon alloys
0.30 copper max
0.60 copper max
Piston alloys (No. 122 type) 29.25-30.75
No. 12 alum. (No. 2 grade) 27.00-27.75
108 alloy
195 alloy
13 alloy (0.60 copper max.)28.00-29.00
AXS-679 26 75-27 50

### Steel deoxidizing aluminum, notch bar

	granul	al	te	ю	1	4	31	•	8	h	٥	t	
Grade	1-95-97%	%		,							×		.26.75-27.50
Grade	2-92-95%	-											.26.25-27.00
Grade	3-90-92%												.25.50-26.25
Grade	4-85-9005												24 75-25 50

### SCRAP METALS

Brass Mill Scrap

shipme	nts			-	2			10	0 lb and	over)
									Heavy	Turnings
Copper				×				*	43 1/2	42 %
Yellow bran	88								3214	29 %
Red brass										37 14
Comm. bro									39 %	3914
Mang. bron	ıze								27%	29 1/4
Yellow bra	68	ro	d		e	n	d	la	32	

### Custom Smelters Scrap (Cents per pound carload lots, delivered

No.	1	copper	to r					36	-36 5
No.	2	copper	wire						4 - 35
		copper							-321
· Re	fin	ery bra	188						323

Ingot Makers Scrap
(Cents per pound carload lots, delivered to refinery)

to rennery)
No. 1 copper wire 36 -3612
No. 2 copper wire 341/2-35
Light copper 32 —32 1/2
No. 1 composition
No. 1 comp. turnings 30 1/2
Hvy. yellow brass solids 22
Brass pipe 23
Radiators 23
Aluminum
Mixed old cast 171/2-181/2
Mixed new clips 18 19

# 

Copper and Brass

No. 1 heavy copper and wire	35
No. 2 heavy copper and wire	33 -34
Light copper	30 -301/2
New type shell cuttings	291/2-30
Auto radiators (unsweated).	191/2-20
No. 1 composition	271/2-28
No. 1 composition turnings	26 1/2 27
Unlined red car boxes	20 -21
Cocks and faucets	21 21 1/2
Clean heavy yellow brass	181/2-19
Brass pipe	221/2-23
New soft brass clippings	221/2-23
No. 1 brass rod turnings	20 -201/

### Alum. pistons and struts.... 14 —15

Aluminum crankcases	16 -1612
Old sheet and utensils Borings and turnings	16½-17 8½-9
Industrial castings	$13\frac{1}{2}$ $-14$ $16$ $-16\frac{1}{2}$
Zinc	

## New zinc clippings 8 — Old zinc 5 — Zinc routings Old die cast scrap

Nickel and Monel
Pure nickel clippings \$1.75-\$2.00
Clean nickel turnings \$1.65-\$1.85
Nickel anodes \$1.75-\$2.00
Nickel rod ends \$1.75-\$2.00
New Monel clippings 80-90
Clean Monel turnings 65-70
Old sheet Monel 70-80
Nickel silver clippings, mixed. 25
Nickel silver turnings mixed 21

### Lead

Miscellaneous	
Block tin	84 85
No. 1 pewter	66 —67
Auto babbitt	43 1/2 44 1/4
Mixed common babbitt	10 %
Solder joints	20 -20 4
Siphon tops	1614-161
Monotype	
Lino. and stereotype	
Electrotype	13 -13 4
Hand picked type shells	1014-11
Lino. and stereo. dross	5% - 6
Electro. dross	4%- 0

	TEEL		rs, blo	oms,	PIL-		HAPES		STRIP										
	RICES (Effective	Carbon Rerolling Net Ton	Carbon			SIR	Hi Str.	Carbon Wide-	Hot-	Cald-	Hi Str. H.R. Low	Hi Str. C.R. Low	Alloy Hot-	Alloy Cold-					
	14y 8, 1536)	Net Ton	Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Low	Flange	rolled	relled	Ailoy	Alloy	rolled	rolled					
	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3											
1	Buffalo, N. Y.	\$68.50 B3	\$84.50 R3 B3	\$96.00 R3, B3	5.45 B3	6.65 B3	6.80 B3	4.65 B3	4.325 R3,B3	6.25 B3 6.25 R7,510	6.425 B3	9.10 B3							
1	Clayment, Del.																		
1	Harrison, N. J.													13.45 C//					
1	Conshohocken, Pa.							-	4.375 A2	6.30 AZ	6.425 A2								
	New Bedford, Mass.									6.70 R6									
EAST	Johns own, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3												
2	Boston, Mass.									6.80 78				13.80 78					
	New Haven, Coan.									6.70 DI A5									
	Phoenixville, Pa.					5.15 P2		5.15 P2											
	Sparrows Pt., Md.								4.325 B3	6.25 B3	6.425 B3	9.10 B3							
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8						4.625 N8	6.70 W1			7.50 N8						
	Wallingford, Conn. Pawtucket, R. I.					-		-		6.80 N7				AS					
	Worcester, Mass.									A5				13.80 N7					
	Aken, Ill.								4.50 L1										
	Ashland, Ky								4.325 A7										
	Canton-Massillen, Dever, Ohio		\$86.50 R3	196.00 R3										13.45 G4					
	Chicago, III.	\$68.50 UI	\$84.50 R3, U1,W8	\$96.00 R3, UI,W8	5.45 UI	4.60 UI, W8	6.75 UI. YI	4.60 UI	4.55 A! 4.325 N4,W8	6.35 AI, T8			7.20 W8	13.45 78					
	Cleveland, Ohio									6.25 A5, J3		9.30 45		13.45 A					
	Detroit, Mich			\$96.00 R5		-			4.425 G3,M2	6.35 DI,D2 G3 M2,PII	6.525 G3	9.20 D2, G3							
	Duluth, Minn.		******			4.00 (1)	e 25 F/1		4 200 12	6.35 /3	6.425 /3,	9.30 YI	7.20 YI,						
WEST	Gary, Ind Harbor, Indiana	\$68.50 U1	\$84.50 UI	\$96 98 UI, YI	6.45 /3	4.60 U1, 13	6.75 U1, 13		4.325 /3, UI, YI	6.25 YI	UI, YI	3.36 17	Üi						
MIDDLE	Sterling, 111.								4.425 N4										
ME	Indianapolis, Ind									6.40 C5									
-	Newport, Ky.												7.20 N5						
	Middletown, Ohie									6.45 A7			7.00 61	10.45 €					
	Niles, Warren, Ohio Sharen, Pa.	\$68.50 C10	\$84.50 C/O	\$96.80 C10					4.32\$ SI, R3	6.25 SI, R3,T4	6.425 SI, R3	9.10 SI, R3	7.20 SI	13.45 S					
	Pittsburgh, Pa. Midland, Ps. Butler, Ps.	68.50 UI. J3	\$84.50 J3, UI,CII	\$96.00 UI, CII	5.45 UI	4.60 UI, J3	6.75 UI, J3	4.60 UI	4.325 P6	6.25 S7,B4			7.20 S9	13.45 S					
	Portsmouth, Ohio																		
	Weirton, Wheeling, Follansbee, W. Va.					4.60 W3			4.325 W3	6.25 F3,W3	6.425 W3	9.10 W3							
	Youngstown, Ohio		\$84.50 C/0	\$96.00 Y/, C/O			6.75 YI		4.325 UI, YI	6.25 YI,CI	6.425 UI. YI	9.30 YI	7.20 UI, YI	13.45 C					
-	Fentana, Cal.	78.90 K1	94.00 K/	117.00 K/		5.30 K1	7.40 K1	5.45 <i>K1</i>	5.125 K/	0.00 KI	7.575 K1		8.95 K/						
	Geneva, Utah		\$84.50 C7			4.60 C7	6.75 C7												
	Kansas City, Mo.					4.70 S2	6.85 S2				6.675 S2		7.45 S2						
le:	Los Angeles, Terrance, Cal.		\$94.00 B2	\$116.00 B	2	5.30 C7, B2	7.45 B2		\$.875 C7, B2	8.30 CI			8.40 B2						
WEST	Minnequa, Colo.					4.90 C6			5.425 C6										
	Portland, Ore.					5.35 02													
	Son Francisco, Nilos Pittaburg, Cal.		\$94.00 B2			S.25 B2, P9	7.40 B2		5.875 B2, C7										
	Seattle, Wash.		\$98.00 B2			5.35 B2	7.50 B2		5.325 B2										
_	Atlanta, Ga.				-				4.525 .48										
SOUTH		\$68.50 T2	\$84.50 T2			5.10 C/6 4.60 R3, T	6.75 T2		4.325 R3.7 4.825 C/0	7	6.425 72								
20	Houston, Lone Star	\$74.50 L3	\$89.50 S2	\$101.00 S	-	4.70 S2	6.85 52				6.675 SZ		7.45 52						

	RICES				WIRE ROD	TINPI	LATE†	BLACK PLATE						
	(Effective ay 8, 1956)	Het-relied 18 ga. & hvyr.	Cold- relied	Galvanized	Enameling 12 ga.	Long Terme 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.		Cokes* 1.25-lb, base box	Electro* 0.25-lb. base box	Holloward Enameling 29 ga.
1	Bathlehem, Fa.													
	Bufalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			5.375 W6	† Special co	ated mfg. 50¢ from	
-	Claymont, Del.											1.25-lb. coke price. Can-n	base box naking quality to 128 lb.	
-	Custosville, Pa.											deduct \$2,20	from 1.25-lb.	
-	Conshoheckan, Pa.	4.375 A2	5.375 A2				6.425 A2					* COKES: add 25¢.	1.50-lb.	
	Harrisburg, Pa.											ELECTRO: 25¢; 0.75-lb.	0,50-lb. add	
EAST	Hartford, Conn.											1.00-lb. add ential 1.00 ll	\$1.00. Differ-	
	Johnstown, Pa.										5.375 B3	add 65¢.		
	Fairless, Pa.	4.375 UI	5.375 UI				6.425 UI	7.925 UI				\$9.70 UI	\$8.40 UI	
	New Haven, Conn.													
1	Phoenixville, Pa.													
1	Sparrows Pt., Md.	4.325 B3	5.325 B3	\$.85 B3			6.375 B3	7.875 B3	8.60 B3		5.475 B3	\$9.70 B3	\$8.40 B3	
1	Wercester, Mass.										5.675 A5			
	Trenten, N. J.													-
-	Alten, III.										5.55 <i>L1</i>			
	Ashland, Ky.	4.325 A7		5.85 47	5.90 A7									
	Canton-Massillon,			5.85 RI.										
	Dever, Ohio			RJ										
	Chicago, Joliet, III.	4.55 A! 4.325 W8					6.375 UI				5.375 N4 5.375 A5, R3			
	Sterling, III.										5.475 N4			
	Cleveland, Ohio	4.325 /3,	5.325 /3,		5.90 R3		6.375 /3,	7.875 J3,			5.375 A5			
	Detroit, Mich.	R3 4.425 G3,	R3 5.425 G3	-			R3 6.475 G3	R3 7.975 G3						-
	Devien, Mich.	M2	5.325 M2				6.413-05	1.313 03						
_	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5					-					
MIDDLE WEST	Gary, Ind. Harber,	4.325 /3,	5.325 /3,	5.85 UI.	5.90 U1.	6.25 UI	6.375 YI,	7.875 UI,	-		5.375 Y/	\$9.60 /3,	\$8.30 I3, UI, YI	7.05 UI, YI
18	Indiana	UI,YI	UI,YI	13	13		U1,13	YI				UI,YI	01,11	
QQI	Granite City, III.	4.525 G2	5.525 G2	6.85 G2	6.10 G2								\$8.40 G2	7.15 G2
×	Kokomo, Ind.			5.95 C9							5.475 C9			
	Mansfield, Ohio	4.325 E2	5.325 E2			6.25 E2								
	Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7								
	Niles, Warren, Ohie Sharon, Pa.	4.325 SI, R3,N3	5.325 R3, N3	5.85 R3 6.85 N3	5.90 N3	6.25 N3	6.375 SI, R3	7.875 R3					\$8.30 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 /3, UI,P6	5.325 /3, UI,P6	5.85 UI	5.90 UI, A7		6.375 J3, UI	7.875 UI	8.60 UI		5.025 P6 5.375 A5	\$9.60 J3, UI	\$8.30 J3, UI	7.05 UI
	Pertamouth, Ohio	4.325 P7	5 325 P7								5.375 P7			
	Weirten, Wheeling, Follansboo, W. Va.	4.325 W3, W5	5.325 W3, W5,F3	S.8S W3, W5		6.25 W3. W5	6.375 W3	7 875 W3				\$9.60 W3, W5	\$8.30 W3, W5	7.05 F3, W5
	Youngstown, Ohio	4.325 UI,	5.325 YI		5.90 Y/	77	6.375 U1.	7.875 Y/			5.375 Y/			
		YI					YI						20.07	80.15
	Fentane, Cal.	5.125 K1	6.525 K1				7.175 K1	9.075 K1				\$10.35	\$9.05	\$8.15
	Geneva, Utah	4.425 C7					-				5.625 S2			
	Kansas City, Me.	-		-							6.175 B2		-	
WEST	Les Angeles, Terrance, Cal.										0.110 03			
	Minnequa, Cole.										5.625 C6		***************************************	
	San Francisco, Niles Pittaburg, Cal.	5.825 C7	6.275 C7	6.60 C7							5.675 C7	\$10.35 C7	\$9.05 C7	
	Seattle, Wash.													
	Atlanta, Ga.													
HE	Fairfield, Ala.	4.325 R3,	5.325 77	5.85 R3, T2			6.375 T2			5.625 R3	5.025 R3 5.375 T2	\$9.70 T2	\$8.40 T2	
SOUTH	Alabama City, Ala. Houston, Tez.		-	- 11	-	-	-		-		5.625 S2			

	STEEL		neares resenting p	roducers listed	in key at end o	table. Date ;	rices, Lat.D. III	ill, in cents per l	.,	CWINE DELLA.	1	
	RICES			BAI	RS				PLA	TES		WIRE
	(Effective fay 8, 1956)	Carbon Steel	Reinforc-	Cold Finished	Alloy Hot- relled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carben Steel	Floor Plats	Alley	Hi Str. Lew Alley	Mfr's. Bright
1	Bethlehem				5.575 B3	7.425 B3	6.80 B3					
-	Buffalo, N. Y.	4.65 B3,R3	4.65 B3, R3	6.30 B5	5.575 B3,R3	7.425 B3,B5	6.80 83	4.50 B3,R3				6.60 W6
-	Clayment, Del.							A.BD Cr		6.30 Cf	6.725 C4	
	Coatesville, Pa.							4.80 L4		6.30 L4	6.725 L4	
	Conshohocken, Pa.							4.50 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 P2	5.575 C3			
	Hartford, Com.			6.75 R3		7.725 R3						
EASI.	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B3	6.725 B3	6.60 B3
3	Fairless, Pa.	4.80 Ui	4.80 UI		5.725 <i>U1</i>							
1	Newark, N. J.			6.70 W10		7.50 W10						
	Camden, N. J.			6.70 P10								
	Bridgeport, Putnam, Conn.	4.80 N8		6.80 W10	5.725 N8			4.750 NB				
1	Sparrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.70 B3
1	Palmer, Worcester,			6.70 W11		7.725 A5 B5		4.50 R3				6.90 A5
	Readville, Mass. Milton, Pa.	4.80 M7	4.80 M7	6.45 C14 6.70 B5								6.90 W6
1	Spring City, Pa.			6.35 K4		7.60 K4						
	Alten, Ili.	4.85 <i>L1</i>										6.775 <i>L1</i>
1	Ashland, Newport, Ky.							4.50 A7,N3		6.30 N5		
1	Canton-Massillon,	4.75 R3		6.25 R2, R3	5.575 R3, T5	7.425 R2,R3,		4.50 EI				
	Manafield, Ohio					T5					4 708 7/1	4 60 45 B
	Chicago, Joliet, III.	4.65 UI, N4,W8,R3, 5.15 P/3	4.65 N4,R3, 5.15 P13	6.25 B5,W8, W10,A5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.50 UI,W8, 13,R3 4.725 AI	8.575 UI	6.30 UI	6.725 U1	6.60 A5,R N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	6.25 A5,C13		7.425 A5,C13	6.80 R3	4.60 J3,R3	5.575 /3		6.725 R3, J3	6.60 A5, C/3
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.45 B5 6.50 P3 6.10 P8	5.575 <i>R5</i> 5.675 <i>G3</i>	7.425 R5 7.625 B5,P3, P8	6.90 G3	4.60 G3			6.825 G3	
WEST	Duluth, Minn.											6.60 A5
MIDDLE W	Gary, Ind. Harber, Crawfordsville	4.65 13, UI, YI	4.65 <i>13, U1,</i> Y1	6.25 M5, R3	5.575 <i>13, U1,</i> Y1	7.425 M5, R3	6.80 U1,13, Y1	4.50 <i>13, U1,</i> Y1	\$.575 /3	6.30 UI, YI	6.725 U1, 13, Y1	6.35 M4
M	Granite City, III.							4.70 G2				
	Kekeme, Ind.											6.70 C9
	Sterling, Ill.	4.75 N4	4.75 N4									6.70 N4
	Niles, Warren, Ohio Sharen, Pa.	4.65 R3,C10		6.25 C/O	5.75 C/O	7.425 C10	6.80 R3	4.50 SI,R3		6.30 SI	6.725 SI	
	Pittaburgh, Pa. Midland, Pa.	4.65 J3, UI, CII	4.65 J3, UI	6.25 A5,C8, C11,J3, W10,B4,R3	5.575 UI,CII	7.425 A5,C11, W10,C8,R3	6.80 J3, UI	4.50 J3, UI	8.575 UI	6.30 UI	6.725 J3, U	6.60 A5., P6
	Partsmouth, Ohio											6.60 P7
	Weirton, Wheeling, Follanabee, W. Va.	4.45 W3						4.50 W3,W5				
	Youngstown, Ohio	4.65 UI, YI, CIO, R3	4.65 UI, YI, R3	6.25 YI, UI	5.575 UI, YI, CIO	7.425 Y1,C10 F2	6.80 UI, YI	4.50 UI, YI,		6.30 YI	6.725 Y/	6.60 YI
_	Emeryville, Cal.	5.40 J5	5.40 /5					-				
	Fentana, Cal.	5.35 KI	5.35 K1		6.625 K1		7.50 KI	\$.20 KI		7.00 KI	7.375 K1	
	Genera, Utah	-						4.50 C7			6.725 C7	
	Kansas City, Mo.	4.90 SZ	4.90 S2		5.825 S2		7.05 S2					6.85 SZ
WEST	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.70 R3	6.625 B2		7.50 B2				7.625 B2	7.55 B2
1	Minnequa, Cale.	5.10 C6	5.10 C6					5.35 C6				6.85 C6
	Portland, Ore. San Francisco, Niles	5.40 O2 5.35 C7	5.40 O2 5.35 C7				7.55 B2					7.55 C7
	Pittsburg, Cal. Seattle, Wash.	5.40 B2,P9 5.40 B2,P12	5.40 B2,P9			-	7.55 B2	5.40 B2		7.29 82	7.425 B2	7.55 C6
_	Maria C	N6	495 45			-		-	-		-	6.90 //8
SOUTH	Atlanta, Ga. Fairfield, Ala. City, Birmingham, Ala.	4.65 T2, R3 5.15 C/6	4.65 T2,R3 5.15 C/6				6.80 72	4.50 T2,R3			6.725 T2	6.66 R3, 72
20	Houston, Ft. Worth,		4.90 S2		5.825 S2		7.05 S2	4.85 L3 4.60 S2		6.40 S2	6.825 57	6.85 S2

### Steel Prices (Effective May 8, 1956)

### **Key to Steel Producers**

With Principal Offices

- Al Acme Steel Co., Chicago
  Al Alan Wood Steel Co., Conshohorken, Pa.
- A3 Allegheny Ludlum Steel Corp., Pittaburgh Allegheny Ludhum Steel Corp.,
  American Cladmetala Co., Carnegie, Pa.
  American Steel & Wire Div., Cleveland
- A4
- 45
- Angell Nail & Chaplet Co., Cleveland A7 Armco Steel Corp., Middletown, O.
- AB Atlantic Steel Co., Atlanta Ga.
- BI Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- Bethlehem Pacific Coast Steel Corp., San Francisco R2
- Bethlehem Steel Co., Bethlehem, Pa.
- Blair Strip Steel Co., New Castle, Pa. B4 B5
- Bliss & Laughlin, Inc., Harvey, Ill. Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa. B6
- C1 Calstrip Steel Corp., Los Angeles C2 Carpenter Steel Co., Reading, Pa.

- C2 Carpenter Stees Co., recasing, ra.
  C3 Central Iron & Steel Co., Harrisburg, Pa.
  C4 Claymont Products Dept., Claymont, Del.
  C5 Cold Metal Products Co., Youngstown, O.
- Colorado Fuel & Iron Corp., Denver
- C7 Columbia Geneva Steel Div., Denver
  C8 Columbia Steel & Shafting Co., Pittaburgh
  C9 Continental Steel Corp., Kokomo, Ind.

- C10 Copperweld Steel Co., Pittsburgh, Pa.
- C11 Crucible Steel Co. of America, Pittaburgh
- C12 Cumberland Steel Co., Cumberland, Md.
- C/3 Cuyahoga Steel & Wire Co., Cleveland
- C13 Cuyahoga Steel & Wire Co., Cleveland
  C14 Compressed Steel Shafting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C/7 Chester Blast Furnace, Inc., Chester, Pa.
- DI Detroit Steel Corp., Detroit
- D1 Detroit Tube & Steel Div., Detroit
- D3 Driver Harris Co., Harrison, N. J.

  D4 Dickson Weatherproof Nail Co., Evanston, Ill.

  01 Oliver Iron & Steel Co., Pittsburgh

  02 Oregon Steel Mills, Portland
- 13 Henry Disston & Sons, Inc., Philadelphia
- El Eastern Stainless Steel Corp., Baltimore
- El Empire Steel Co., Mansfield, O.
- FI Firth Sterling, Inc., McKeesport, Pa.
- Fitzsimmons Steel Corp., Youngstown
- F3 Follansbee Steel Corp., Follansbee, W. Va.
- GI Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.
  - G3 Great Lakes Steel Corp., Detroit
  - G4 Greer Steel Co., Dover, O
  - HI Hanna Furnace Corp., Detroit
- Ingersoll Steel Div., Chicago
   Inland Steel Co., Chicago
   Interlake Iron Corp., Cleveland

  - J1 Jackson Iron & Steel Co., Jackson, O.
  - 12 Jessop Steel Corp., Washington, Pa.
  - J3 Jones & Laughlin Steel Corp., Pittsburgh
  - Joslyn Mfg. & Supply Co., Chicago
     Judson Steel Corp., Emeryville, Calif.
  - KI Kaiser Steel Corp., Fontana, Cal.
  - K7 Keystone Steel & Wire Co., Peoria
  - K? Keystone Steel & Wire Co., Peoria
    K3 Koppers Co., Gravite City, III.
    K4 Keystone Drawn Steel Co., Spring City, Pa.
  - LI Laclede Steel Co., St. Louis
  - L2 La Salle Steel Co., Chicago L3 Lone Star Steel Co., Dallas
  - L4 Lukens Steel Co., Coatesville, Pa.

  - M1 Mahoning Valley Steel Co., Niles, O.
    M2 McLouth Steel Corp., Detroit

    - M3 Mercer Tube & Mfg. Co., Sharon, Pa.
    - M# Mid-States Steel & Wire Co., Crawfordsville, Ind M5 Monarch Steel Div., Hammond, Ind.
    - M6 Mystic Iron Works, Everett, Mass.

    - M7 Milton Steel Products Div., Milton, Pa.
  - NI National Supply Co., Pittsburgh
  - N2 National Tube Div., Pittsburgh

    - N3 Niles Rolling Mill Div., Niles, O. N4 Northwestern Steel & Wire Co., Sterling, Ill.
    - N5 Newport Steel Corp., Newport, Ky.
    - No Northwest Steel Rolling Mills, Seattle

    - No Northwest Steel Rolling Mills, Seattle

      N7 Newman Crosby Steel Co., Pawtucket, R. I.

      N8 Northeastern Steel Corp., Bridgeport, Conn.

    - P1 Page Steel & Wire Div., Monessen, Pa.
    - P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
    - P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
    - P4 Pittsburgh Coke & Chemical Co., Pittsburgh
    - P5 Pittsburgh Screw & Bolt Co., Pittsburgh
    - P6 Pittsburgh Steel Co., Pittsburgh P7 Portsmouth Div., Detroit Steel Corp., Detroit
    - P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit
- P12 Pacific Steel Rolling Mills, Seattle
- P13 Phoenix Mfg. Co., Joliet, Ill.
- RI Reeves Steel & Mig. Co., Dover, O.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O
- R3 Republic Steel Corp., Cleveland
- R4 Roebling Some Co., John A., Trenton, N. J. R5 Rotary Electric Steel Co., Detroit
- R6 Rodney Metals, Inc., New Bedford, Mass
- R7 Rome Strip Steel Co., Rome, N. Y.
- SI Sharon Steel Corp., Sharon, Pa. S2 Sheffield Steel Corp., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw and Steel Co., Fitchburg, Mass.
- 55 Sweet's Steel Co., Williamsport, Pa.
- Standard Forging Corp., ChicagoStanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- 59 Superior Steel Corp., Carnegie, Pa. S10 Seneca Steel Service, Buffalo
- 71 Tonawanda Iron Div., N. Tonawanda, N. Y.
- T2 Tennessee Coal & Iron Div., Fairfield
- 73 Tennessee Products & Chem. Corp., Nashville
- 74 Thomas Strip Div., Warren, O.
- 75 Timken Steel & Tube Div., Canton, O. 76 Tremont Nail Co., Wareham, Mass.
- 77 Texas Steel Co., Fort Worth
- 78 Thompson Wire Co., Boston
- UI United States Steel Corp., Pittsburgh
- U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- WI Wallingford Steel Co., Wallingford, Cos
- W2 Washington Steel Corp., Washington, Pa. W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo W7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Co., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala. W10 Wyckoff Steel Co., Pittsburgh
- W11 Worcester Pressed Steel Co., Worcester, Mass.
- W12 Wallace Barnes Steel Div., Bristol, Conn. YI Youngstown Sheet & Tube Co., Youngstown, O.

### PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net tee

		BUTTWELD													SEAMLESS									
	1/2	ln.	34	la.	1	In.	13/4	In.	11/2	In.	2 1	la.	21/2	3 In.	2	In.	21/2	in.	3	ln.	31/2	4 In.		
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.		
oparrows Pt. B3	16.50 18.50 6.00	1.25 1.25 13.25	19.50 21.50 9.00	5.25 5.25 +9.25	22.00 24.00 11.50	8.75 8.75 +5.75	24.50 26.50 14.00	9.50 10.00 +4.00	25.00 27.00 14.50	10.50 11.00 +3.00	25.50 27.50 15.00		27.00 29.00 16.50	10.75 11.75 +1.75						******				
Pittsburgh /3	18.50 16.50 18.50 16.50	1.25 1.25 3.25 1.25	21.50 19.50 21.50 19.50	7.25 5.25 7.25 5.25	24.00 22.00 24.00 22.00		26.50 24.50 26.50	11.50 9.50 11.50 9.50	27.00 25.00 27.00 25.00	12.50 10.50 12.50 10.50	27.50 25.50 27.50 25.50	13.00 11.00 13.00 11.00	29.00 27.00 29.00 27.00	12.75 10.75 12.75 10.75	*****			+6.25				*****		
Pittsburgh N1. Wheeling W5. Wheatland W4	18.50 18.50 18.50	3.25 3.25 3.25	21.50 21.50 21.50	7.25 7.25 7.25	24.00 24.00 24.00	10.75 10.75 10.75	26.50 26.50 26.50	11.59 11.50 11.50	27.00 27.00 27.00	12.50 12.50 12.50	27.50 27.50 27.50	13.00 13.00 13.00	29.00 29.00 29.00	12.75 12.75 12.75	4.80	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.2		
Toungstown YI Indiana Harber YI Lerain N2	18.50 17.50 18.50	3.25 2.25 3.25	20.50	7.25 6.25 7.25	24.00 23.00 24.00	9.75	26.50 25.50 26.50	11.50 10.00 11.50	27.00 26.00 27.00	12.50 11.50 12.50	27.50 26.50 27.50	13.00 12.00 13.00	29.00 28.00 29.00	12.75 11.75 12.75		+11.		+6.25	*****	******				
EXTRA STRONG PLAIN ENDS Sparrows Pt. 83	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13,50	28.00	14.50	28.50	15.00	29.00	13.75										
eungstewn R3 airless N2 entana K1	23.00 21.00 10.50	7.25	25.00 14.50					14.00 13.50	30.00 28.00 17.50	15.00	30.50	15.50	31.00											
Pittsburgh 13	23.00 21.00 23.00	9.25 7.25 9.25	25.00		27.00	16.75	27.50	15.50	30.00	16.50 14.50 16.50	30.50	17.00	31.00 29.00 31.00	15.75 13.75 15.75				+2.75						
Pittsburgh NI	23.00 23.00 23.00 23.00	9.25 9.25 9.25 9.25	27.00	13.25	29.00	16.75 16.75 16.75		15.50 15.50 15.50	30.00	16.50 16.50		17.00 17.00 17.00	31.00 31.00 31.00	15.75 15.75 15.75 15.75				+2.75						
Indiana Harbor YI Lerain N2	22.00	8.25 9.25	26.00	12.25	28.00	15.75	28.50 29.50	14.50 15.50	29.00	15.50 16.50		16.00	30.00	14.75 15.75				+2.75						

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on sinc price range of over 9¢ to 11¢ per 1b. East St. Leuis. For each 2¢ change in sinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., a.g., sinc price range of over 11¢ to 13¢ would lower discounts; sinc price in range over 7¢ to 9¢ would increase discounts. East St. Leuis since price now 13.5¢ per b.

### TOOL STEEL

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	-	_	\$1.60	T-1
18	4	1	_	5	2.305	T-4
18	4	2	-	-	1.765	T-2
1.5	4	1.5	8	_	.96	M-1
6	4	3	6	-	1.35	M-3
6	4	2	5	_	1.105	M-2
High	-carb	on ch	romiu	m.,	.77	D-3, D-5
OIL	narde	ned n	nanga	nese	.43	0-2
Spec	ial ca	rbon			.39	W-1
Extr	a car	bon			.33	W-1
Regu	llar c	arbon	rices	on al	.275	of Mis-
alasi	ppi a	re 4¢		lb h		West of

### CLAD STEEL Base prices, cents per lb f.e.b.

		Plate	(A3, J2	. L4)	Sheet (12)
	Cladding	10 pct	15 pct	20 pct	20 pct
	304	30.30	33.15	36.05	32.50
1	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
Stainless Type	347	34.40	37.90	41.40	48.25
S	405	25.80	29.60	33.35	
	410, 430	25.30	29.10	32.85	

CR Strip (S9) Copper, 10 pct, 2 sides, 42.75; 1 side, 33.75.

### **ELECTRICAL SHEETS**

22-Gage	Hot-Relied	Cold-Roduced (Cailed or Cut Length)			
F.o.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed		
Field	8.40	8.60	*****		
Armature	9.35	9.60	10.10		
Elect	9.95	10.20	16.76		
Meter Dyname	11.85	12.10	11.70		
Trans. 72	12.80	13.05	13.55		
Trans. 65	13.35	Grain (	Driented		
Trans. 58	13.85 14.85	Trans. 88 17.6 Trans. 73 17.5			

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (L3); Mansfield (E2); Newport, Ky. (M5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanosville (A7).

\*\*Coils 75c higher.

### LAKE SUPERIOR ORES

lower Lo	Fe natu ke ports. changes	Pr	ice	8	10	27	19	) 5	6	season.
								6	tre	oss Ton
Openhea	rth lump						 			\$12.10
	e, bessem									
	e, nonbes									
	bessemer									
	nonbessen									
High ph	osphorus .									10.85

WARE-									Metre	tropolitan Price, dollars per 100 lb.				
HOUSES		Sheets		Si	trip	Plates	Plates Shapes		ars	Alloy Bars				
Cities City Definery i Charge	Het-Relled	Cold-Relled	Galvanissed (10 gage)	Het-Relled	Cold-Relled		Structural	Het-Relied	Celd- Finished	Hat-Raffed 4615 As reffed	Hwt-Redled 4148 Annealed	Cold-Drawn 4615 As relled	Cold-Drawn 4146 Annealed	
Baltimore\$.10	7.31	8.32	8.37	7.65		7.63	7.93	7.61	8.62	14.38	13.44-	16.36	16.29-	
Birmingham15	6.80	7.93	8.85	7.06	*****	6.99	7.28	7.05	9.35		13.96	*****	16.49	
Besien	8.22	9.17	10.42	8.31	*****	8.51	8.37	8.37	9.83		13.66		16.76	
Buffalo	7.35	8.40	10.16	7.50		7.89	7.75	7.50	8.05		13.45		16.50	
Chicago	7.28	8.39	9.25	7.36	*****	7.60	7.58	7.42	7.90		13.20		16.30	
Cincinnati 15	7.40	8.38	9.10	7.60		7.89	8.05	7.66	8.30	13.59	13.29	16.44	16.39	
Cleveland15	7.28	8.39	9.10	7.46		7.77	7.91	7.48	8.15	13.41	13.11	16.26	16.21	
Denver	8.60	10.76	11.22	8.90		8.60	8.75	8.90	9.82				17.97	
Detroit	7.47	8.58	9.53	7,49		7.88	8.05	7.70	8.19	13.70	13.40	16.55	16.50	
Houston	7.85	8.75	10.49	8.15		7.80	8.20	8,25	9.85-	14.35	14.00	17.15	17.05	
Kansas City 20	7.47	8.76	9.17	7.73		7.66	7.95	7.75	9.95 8.52	13.87	13.52	16.72	16.57	
Les Angeles10	8.25	10.10	11.10	8.60		8.85	8.40	8.25	11.00		14.45		18.00	
Mamphia10	7.12	8.25		7.38		7.31	7.60	7.40	9.15			*****		
Milwaukee15	7.37	8.48	9.34	7.45		7.69	7.75	7.51	8.00		13.29		16.39	
New Orleans15	7.20	8.35		7.45		7.40	7.70	7.50	9.55					
New York 10	7.88	8.98	9.73	8.33		8.31	8.21	8.26	9.87		13.57		16.67	
Norfolk20	7.25			7.65		7.45	7.95	7.65	9.50					
Philadelphia10	7.44	8.54	9.51	8.89		7.82	7.85	7.83	8.62		13.35		16.45	
Pittaburgh15	7.28	8.39	9.55	7.46	9.00	7.60	7.58	7.42	8.00	13.35	13.05	16.20	16.15	
Pertland	7.80-		10.65	8.00	7.95	7.75	7.85-	7.95	12.20		15.00		17.50	
Salt Lake City 20	8.60	10.15		9.35			8.15 9.20	9.15						
San Francisco10	8.30	9.75	10.25	8.45		8.40	8.35	8.25	11.55		14.45		18.00	
Seattle	8.75	10.50	10.90	8.90		8.50	8.50	8.60	12.25		14.65			
St. Louis 15	7.57	8.68	9.54	7.65		7.89	7.98	7.71	8.44		13.49		16.50	
St. Paul	7.94	8.59- 9.14		7.72		7.65	7.94	7.74	8.51		13.51		16.31	

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$.25 delivery. (4) 1000 to 1999 lb. \$.25 delivery. (4) 1000 to 1999 lb. (5) Plus analysis charge.

### **MERCHANT WIRE PRODUCTS**

	Standard & Coated Nails	Weven Wire Fence 9-151/2 ga.	"T" Fence Pasts	Single Leep Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merck. Wire Galv.
F.o.b. Mill	Cel	Cel	Col	Cel	Col	¢/lb.	¢/lb.
Alabama City R3 Aliquippa, Pa. J3 Atlanta A6 Bartenville K2° Buffale W6	. 152 . 154 154	162 167 168		177 175	175 180 181		7.80 7.80 8.125 8.20 7.90
Buffalo W6. Chicago, IR. N4**. Cleveland A6. Cleveland A5. Crawfordsville M4*. Donora, Pa. A5. Duluth A5.	154 152 152	168 162 162		175 177 175 175	181 175 175	7.50 7.40 7.60 7.50 7.50	8.29 7.90 7.99
Fairfield, Ala. T2 Galveston D4 Houston S2 Johnstown, Pa. B3* Joliet, Ill. A5 Kokeme, Ind. C9 Los Angeles B2*	157 157 152 154	170 166 162 154		175	180 175 175 177	7.85 7.49 7.50 7.60 8.35	7.90 8.05 7.80 8.10 8.00 8.925
Kansas City S2  Minnequa C6  Monessen P6  Moline, Ill. R3  Pittsburg, Cal. C7	157 157 157	167 167 162 162 185	162	178	180	7.65 7.65 7.40 8.45	8.05 8.05 7.80 8.85
Portomouth P7 Rankin, Pa. A5 So. Chicage R3. S. San Francisco C6. Sparrows Pt. B3°. Struthers, O. Y1 Worcester A5	152	162	157	173	175	7.40 7.40 8.35	7.90 7.80 8.75 8.20 8.00
Wercester A5 Williamsport, Pa. S5	150		160			7.70	8.20

Galvanized products computed with zinc at 5¢ per lb. Exceptions: "zinc at 12.5¢ per lh; "\*13¢ zinc.

### C-R SPRING STEEL

	CARBON CONTENT								
Cents Per Lb F.e.b. Mill	0.26-0.41 0.40 0.60			0.81- 1.05	1.06-				
Bristel, Conn. W12			10.90	13.05	15.75				
Buffalo, N. Y. R7			10.50	12.65	15.35				
Carnegie, Pa. S9									
Cleveland A5			10.68	12.75	15.45				
Detroit D1			10.70	12.85					
Detroit D2	7.20		10.70	12 00	15.75				
Harrison, N. J. Cll			10.90	13.05					
Indianapolis C5			10.50	12.65	15.35				
New Castle, Pa. B4			10.50	12.65	*****				
New Haven, Conn. D1.			10.90	13.05					
Pawtucket, R. I. N7			10.90	13.05	15.75				
Pittsburgh S7			18.60	12.75					
Riverdale, III. Al			10.60	12.75	15.45				
Sharon, Pa. Sl		9.05	10.60	12.75	15.45				
Trenton R4									
Wallingford W1			10.90	13.05	15.75				
Warren, Ohio T4	. 7.00	8.95	10.50	12.65	15.35				
Weirton, W. Va. W3.		8.95	10.50						
Worcester, Mass. A5	7.65	9.35	10.90	13.05	15.75				
Youngstown C5		8.95	10.50	12.65	15.39				

### BOILER TUBES

S per 100 ft. carload	Si	ze	Sear	nless	Elec. Weld		
lots, cut 10 to 24 ft. F.o.b. Mill	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.	
Babcock & Wilcox	2 2½ 3 3½ 4	13 12 12 11 10	43.22 49.90 58.26		40.31 46.55 54.34		
National Tube	2 21/2 3 31/2 4		43.22 49.90 58.26		40.31 46.55 54.34		
Pittaburgh Steel	2 21/2 3 31/2 4		41.57 47.99 56.03				

### RAILS, TRACK SUPPLIES

F.a.b. Mill Cents Per Lb	Ne. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Belts Untrested
Bessemer UI	4.725	5.65	5. 825				
Sa. Chicago R3.	4.100	0.00	0.000	8.05			
So. Chicago R3. Engley T2	4.725	5.65					*****
Fairfield T2 Gary U1 Ind. Harbor 13.		5.65		8.85		5,625	
Gary Ul	4.725	5.65				5.625	
Ind. Harbor 13.	4.725		5.825	7.90		5.625	
Ind. Harber VI				18 65			
Johnstown B3. Joliet UI Kansas City S2. Leckawanna B	1	5.65					
Joliet UI			5.825				
Kansas City S2.				7.96			
Lackawanna B	4.725	5.65	5.825			5.625	
Lebanon B3 Minnequa C6					****		12.1
Minnequa Co	4.725	6.15	5.825	7.90		5, 625	12.1
Pittsburgh 01.					11.90		12.1
Pittsburgh Po.				12.22		****	12.1
Pittaburgh P5. Pittaburgh J3. Seattle B2	****			8.05			12.2
Seattle BZ	1 2 2 2 2		2 222	8.40	****	5.773	1Z.6
Steelten 23	4.72	***	5.823	0 00	****	5.623	
Steelten B3 Struthers Y1 Terrance C7				8.05		0 220	
Williamsport S.		e 4			****	. 3. //2	
Toungstown R3		3. 6	****	8 65	****		****
r amenfactants VC		deer		10.00	See.	deser	1

COKE
Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa
Foundry, beehive (f.o.b. oven)
Connellsville, Pa \$17.00 to \$18.00
Foundry, oven coke
Buffalo, del'd\$28.75
Chicago, f.o.b
Detroit, f.o.b
New England, del'd 28.55
Seaboard, N. J., f.o.b 26.75
Philadelphia, f.o.b 26.50
Swedeland, Pa., 1.o.b 26.50
Painesville, Ohio, f.o.b 27.50
Erie, Pa., f.o.b 27.50
Cleveland, del'd 29.43
Cincinnati, del'd
St. Paul, f.o.b
St. Louis, f.o.b. 28.50
Birmingham, f.o.b 25.65
Lone Star, Tex., f.o.b 19.50

### **ELECTRODES**

Conts per Ib f.o.b. plant, threaded, with nipples, unboxed.

G	RAPHITE		CARBON*				
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price		
24	84 72	23.00 22.25	40 - 35 38 24	100, 110	9.90		
16 to 18	72	22.50	38	110	9.90		
14	72	23,88	24	72 to 84	10.30		
12	72	23,50	29	98	10.18		
10	60	24.25	17	72	10.35		
7	69	24.50	14	72	10.85		
5	60	27.25	12	60	11.75		
4	40	30.25	10	60	11.84		
3	40	32, 86	8	68	12.16		
214	60 60 60 40 40 20 24	33.75					
2	24	\$2,58		1 1			

<sup>\*</sup> Prices shown cover carbon nipples.

### **ELECTROPLATING SUPPLIES**

EFFCIKOLFWIIIG JOLLFIE	,
Anodes	
(Cents per lb, frt allowed in quant	(tw)
Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	61.92 57.75
Brass, 80-20, ball anodes, 2000 lb	
or more	60.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon (rolled depolarized add 3¢ per lb	90.05
Cadmium	\$1.70
	41.10
Chemicals	
(Cents per lb, f.o.b. shipping poin	
Copper cyanide, 100 lb drum	83.50
Copper sulphate, 5 or more 100 lb	10 10
Nickel salts, single, 4-100 lb bags	18.15
Nickel chloride, freight allowed.	
Sodium cyanide, domestic, fob N. Y.	48.50
1 to 4 200 lb drums (Philadelphia price 22,60)	22.35
Zinc cyanide, 100 to 900 lb Petassium cyanide, 100 lb drum	55.55
N. Y. Chromic acid, flake type, 1 te 20	48.00
100 lb drums	30.25

### **BOLTS, NUTS, RIVETS, SCREWS**

(Base discount, J.o.b. mill)		
Machine and Carriage Bolt		
Fu	lscoun ll Ful e 20,0 tity or	ll case
1/2 in. & smaller x 6 in. & shorter  Larger than 1/2 in. diam. and	61	63
Rolled thread carriage bolts	55	57
1/2 in. & smaller x 6 in. and shorter Lag, all diam. x 6 in. &	61	63
shorter Lag, all diam. longer than	61	63
6 in	55 61	63
Nuts, Hex, HP, reg. & hvy.		
%" or smaller %" to 1%" inclusive 1%" to 1%" inclusive 1%" and larger	64 63 65 61	66 65 67 63
C.P. Hex regular & hvy.		
%" or smaller	64	66
Hot Galv. Nuts (all types)		
14 or smaller	44	47
Finished, Semi-finished, Hex	Nuts	
%" and smaller		66

### **Rivets**

								E	a	18	e	1	94	r	10	90	119	ŀ
3/4	in.	and	larger				9							0	1	19.	96	
										1	P	c	t	0	I	L	181	t
91	16	in a	nd ame	114	· T													b

### Cap Screws

	D4	BCOURT
Bright Trea	-	H.C. Heat
New std. hex head, pack- aged		
%" thru ½" diam. x 6" and shorter	34	20
9/16" and %" x 6" and smaller and shorter %", %", 1" x 6" and	31	16
shorter New std. hex head, bulk	9	+11
%" thru %" diam. x 6" and shorter	49	41
9/16" and %" diam. x 6" and shorter	48	39
*Minimum quantity per	31	20
15,000 pieces ¼", 5/16", 5,000 pieces 7/16", ¼", 2,000 pieces ¾", ¼", 1"	9/16 diar	liam. ", %" diam n.

### Machine Screws & Stove Bolts

		Diac	Ount
		Mach. Screws	Stove
Packaged, 1 Bulk, bulk	package list	27	38
	Quantity		
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	\$ 5,000-100,000	-	61

Machine	Screw	B 3	tove	Bolt	Nu	its.
				He		Square
Packaged Bulk, bul		re li	st	. 24	ŧ	27
	6	uan)	tity			
%-in. diam. &	25,0	00-2	00,00	0 1	В	20

### CAST IRON WATER PIPE INDEX

6 in. 01	r lo	187	91	69	٠.	1	b	8	u	1	a	91	d	8	p	6	g	0	ŧ	1	pi	ij	e. Bx- Source:
																							heavier
San Fr	and	is	c	0	-1	4		1	١.												,	*	134.8
Chicago		4.1																					125.7
New Y	ork						*	*				*				*		*	*	×			123.7
Birmin																							

### REFRACTORIES

Fire Clay Brick C	arloads per 1006
First quality, Ill., Ky., Mc	L. Mo., Ohio, Pa.
(except Salina, Pa., ad No. 1 Ohio	d \$5.00) \$122.00
Sec. quality, Pa., Md., Ky.,	Mo., Ill. 114.00
No. 2 Ohio	
(except Salina, Pa., add	\$1.50). 18.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala	\$128.00
Childs, Hays, Pa	138.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty	
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O	145.00
Curtner, Calif	163.04
Silica cement, net ton, bulk, East-	
ern (except Hays, Pa.)	
Silica cement, net ton, bulk, Hays	

Silica cement, net ton, bulk, Hays,	24.00
Silica cement, net ton, bulk, Chi- cago District, Ensley, Ala	22.00
Silica cement, net ton, bulk, Utah and Calif	32.00
Chrome Brick Per n	et ton
Standard chemically bonded, Balt.	
Standards chemically bonded, Curt-	

### Magnesite Brick

Grain Ma	gnesi	te		St.	%-in.	grains
Domestic, in bulk Domestic.	fines	ren	noved		Wash.,	\$64.00
Luning, in bulk						40.00

Dead F.o.b.	bulk	. n	rod	uel	n	æ		TD4	of	ni	t m	1	1	n	:	
Pa.,	W. 1	٧a.,	Op	110	*		*	* *	*	* 1			*		. \$1	5.60
Mid	west	Vel	low			6	0			0 1						4.00

### METAL POWDERS

Per pound, f.o.b. shipping point,	in ton
lots, for minus 100 mesh.	
Swedish sponge iron c.l.f.	
New York, ocean bags	9.50#
Canadian spronge iron,	
Del'd in East, carloads	9.54
Domestic sponge iron, 98+%	
Fe, carload lots	9.54
Electrolytic iron, annealed,	
imported 99.5+% Fe	27.54
domestic 99.5+% Fe	36.54
Electrolytic iron, unannealed	
minus 325 mesh, 99+% Fe	57.0#
Electrolytic iron melting	
stock, 99.84% pure	22.0€
stock, 99.84% pure Carbonyl iron size 5 to 10	
micron, 98%, 00.8+% Fe., 36.00	to \$1.55
Aluminum freight allowed	38.00∉
Aluminum freight allowed Brass, 10 ton lots37.50¢	to 50.00€
Copper, electrolytic	61.50¢
Copper, reduced	61.504
Cadmium, 100-199 lb. 95¢ plus me	tal value
Chromium, electrolytic 99.85%	
min. Fe .03 max. Del'd	\$5.00
Lead	tal value
Manganese Molybdenum, 99%\$3.00	70.0€
Molybdenum, 93%	to \$3.25
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.06
Nickel, spherical, unannealed,	
#80	\$1.18
Silicon	43.50¢
Nickel, spherical, unannealed, #80 Silicon Solder powder . 7.0¢ to 9.0¢ plus n	et. value
Stainless steel, 302	99.0∉
Stainless steel, 316	\$1.32
Stainless steel, 302	tal value
Tunksten, sym (ob mess)	47.00
Zinc, 10 ton lots 18.75¢	to 32.50¢



The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

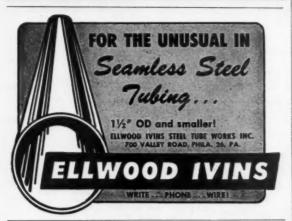
Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

Write for New Catalog of Patterns



TIN, STEEL, COPPER, ALUMINUM, BRONZE BRASS, ZING, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS





Made to your specifications in all thicknesses from .002 to .375 inches and widths from ½" to 19" depending upon gauge.

NARROW ROLLED ROUND EDGE STRIP STEEL In stock at CENTRAL STEEL & WIRE CO. Detroit, Chicago, Cincinnali Wm. H. LEONORI & CO., Inc. New York City GRIFFIN

MANUFACTURING CO. ERIE, PA.



CLEVELAND 5, OHIO

### **Ferroalloy Prices**

(Effective May 8, 1956)		
Ferrochrome  Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.  0.02% C . 38.50 0.20% C . 35.50 0.03% C . 38.00 0.50% C . 35.25 0.06% C . 35.25 0.06% C . 36.50 1.00% C . 34.00 0.10% C . 36.00 1.50% C . 33.85 0.15% C . 35.75 2.00% C . 33.75 4.00-4.50 C, 67.70% Cr, 1-2% Si . 26.25 3.50-5.00% C, 57-64% Cr, 2.00-4.50%	Spiegeleisea  Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa. Manganese Silicon 16 to 19% 3% max. \$92.00 19 to 21% 3% max. \$4.00 21 to 23% 3% max. 96.50  Manganese Metal  Contract basis, 2 in. x down, cents per pound of metal, delivered. 95.50% min. Mn, 0.2% max. C, 1% max.	Ainifer, 20% Al, 40% Si, 46% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb. Carloads 10.656 Ton lots 11.806  Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo \$1.34  Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb. Ton lots 36.96
9.025% C (Simplex)       31.75         0.10% C, 55-52% Cr, 2% max Si       33.75         8.50% max C, 50-55% Cr, 3-6% Si       22.50         8.50% C, 50-55% Cr, 3% max Si       22.50	Si, 2.5% max. Fe. Carload, packed	Less ton lots. 6.95 Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x
High Nitrogen Ferrochrome Low-carbon type 0.75% N. Add 5¢ per ib to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N. Chromium Metal Contract prices per ib chromium con-	Flectrolytic Manganese F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. Carloads 31.5 Ton lots 33.5 250 to 1999 lb 35.5 Premium for hydrogen - removed	D per lb con't Sb plus Ta
Contract prices, per lb chromium consained, packed, delivered, ton lots, 97% min. Cr. 1% max Fe. 9.10% mix. C . \$1.27 9.10% max. C . \$1.27 9 to 11% C, 88-91% Cr, 0.75% Fe. 1.36 Electrolytic Chromium Metal Contract prices per lb of metal 2" x D	Medium Carbon Ferromanganese Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 22.85	10 tons to less carload\$110.00  Ferrotitanium, 40 % regular grade, 4.10 % C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per 1b contained Ti\$1.35
plate (¾" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max. Carloads 1.25 Ton lots 1.27 Less ton lots 1.29	Carlo Ferromanganese Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%. Carloads Ton Less 0.07% max. C, 0.06%	Ferrotitanium 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville. Pa., freight allowed, ton lots, per lb contained Ti
Corbon Ferrochrome Silicon (Cr 34-41%, Si 42-45%, C 0.05% max.)   Contract price, carloads, delivered, lump, 3-in, x down, per lb of Cr, packed.   Carloads	0.07% max. C, 0.06% P, 90% Mn . 34.00 36.55 37.75 0.07% max. C . 31.95 34.50 35.70 0.10% max. C . 31.20 33.75 34.95 0.15% max. C . 30.45 33.00 34.20 0.30% max. C . 28.95 31.50 32.70 0.50% max. C . 28.45 31.00 32.20 0.75% max. C, 30-35% Mn, 5.0-7.0% Si 25.45 28.00 29.20	Ferrotitunium, 15 to 18% high carbon, f.o.b. Niagara Falls. N. Y., freight allowed, car- load, per net ton
Colcium-Silicon  Contract price per lb of alloy, lump, selivered, packed. 30-33% Cr, 60-65% St, 3.00 max. Fe. Carloads	Silicomanganese  Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.  Carload bulk 12.00  Ton lots 13.45  Briquet contract basis carloads, bulk,	contained Mo, f.o.b. Langeloth. Pa. bags, f.o.b. Washington. Pa. Langeloth, Pa. Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo.
Contract prices, cents per lb of alloy, nump, delivered, packed. 16-20% Ca, 14-18% Mn, 53-59% Si. Carloads 23.05 Ton lots 24.95 Less ton lots 25.95	delivered, per lb of briquet 13.55 Ton lots, packed	Carload, bulk lump
Contract prices, cents per pound of alloy, delivered, 60-65% SI, 5-7% Mn, 5-7% Zr, 20% Fe ½ In. x 12 mesh. Ton lots	Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. T., \$93.00.  Silicon Metal Contract price, cents per pound con-	35-40%, f.o.b. freight allowed, carloada. packed 26.254 12-15%, del'd, lump, bulk-carloads
V Foundry Alloy Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% St, 8-11% Mn, packed.	tained Si, lump size, delivered, packed.  10 stained Si, lump size, delivered, packed.  10 stained Si, lump size, delivered, packed.  11 stained Si, lump size, delivered, packed.  12 stained Si, lump size, delivered, packed.  13 stained Si, lump size, delivered, packed.  14 stained Si, lump size, delivered, packed.  15 stained Si, lump size, delivered, packed.  16 stained Si, lump size, delivered, packed.  17 stained Si, lump size, delivered, packed.  18 stained Si, lump size, delivered, packed.  19 stained Si, lump size, delivered, packed.  19 stained Si, lump size, delivered, packed.  10 stained Si, lump size,	Borosil, contract prices per lh of alloy del. f.o.b. Philo. Ohio. freight allowed. B 3.14%. Si 40-45%, per lb contained 2 \$5.25
Carload lots 17.29 Ton lots 18.79 L-as ton lots 19.95 Graphidox No. 4	Silicon Briquets  Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.  Carloads, bulk	Ton lots, per pound
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.  Carload packed 18.50 Ton lots to carload packed 19.65 Less ton lots 20.90	Contract price, cents per lb contained   Si, lump, bulk, carloads, f.o.b. shipping point.   50% Si 12.75   75% Si 15.40   65% Si 14.50   85% Si 17.10	Ferroboros, 17.50% min. B, 1.50% max. Sl, 0.50% max. Al, 0.50% max. C. 1 in. x. D, ton lots
Ferromangonese  Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.  Cents per-lb Marletts, Ashtabula, O.; Alloy,	Calcium Metal  Eastern zone contract prices, cents per pound of metal, delivered.	freight allowed, 100 lb and over No. 1
Marietta,         Ashtabula,         O.:         Alloy,           W. Va.;         Sheffield,         Ala.;         Portland,           Ore.         10.75           Johnstown,         Pa.         10.75           Sheridan,         Pa.         10.75           Philo.         Ohio.         10.75           S.         Duquesse         10.75           Add or subtract 0.1¢ for each 1 pct Mn         10.75	Ton lots \$2.05 Less ton lots \$2.40 \$2.95 \$3.75 \$4.55	Manganese - Boron, 75.00 % Mn.   15-20 % B, 5 % max. Fe, 1.50 %   max. Sl, 3.00 % max. C, 2 in. x   D, del'd.   D, del'd.   Ton lots   \$1.40
Add or subtract 0.1¢ for each 1 pct Mn above or below base content. Briquets, delivered, 66 pct Mn: Carloads, bulk	50-55% V contract, basis, delivered, per pound, contained V, carloads, packed. Openhearth 3.10 Crucible 3.20 High speed steel (Primos) 3.30	Mickel-Boron, 15-18% B. 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots



### MSTRONG EYE BOLTS

to increased tensile strength and proof-tested to 50% beyond rated "safe working load," ARMSTRONG Eye Bolts are strong, dependable and safe. Blank or threaded, "Plain or Shoulder" patterns. 15 standard sizes and special lengths, Write for Catalog.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
\$209 ARMSTRONG AVE. CHICAGO 30, U.S.A.

### FORGINGS

ALL SIZES, pressed . . relied . . extruded . . forged to occurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.

Over 50 years of forging design and development

THE CANTON DROP FORGING & MFG. CO. CANTON, OHIO



THE EASTERN MACHINE SCREW CORP., 21-61 Barclay Street, New Haven, Conn. Pacific Coast Representative: A. C. Behringer, Inc., 334 N. San Pedro St., Lood Angeles, California. Canada: P. P. Barber Machinery Co., Torosto, Gun

### J. BOYNTON AND CO. CONSULTING ENGINEERS

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### FLANGE BEAMS---

### **Prompt Shipment**

4"	@	13#		10"	@	15#		14"	@	30#	
6"	@	20#		10"	@	21#		14"	@	34#	
6"	@	22.5#		10"	0	33#		14"	@	38#	
6"		27.5#		12"	@	27#		14"	@	43#	
8"	0	10#		12"	@	31#		14"	@	53#	
8"	@	17#	**	12"	0	36#		14"	@	58#	
8"	@	28#		12"	@	40#	Mill	Lengths	an	d cut	
8"	@	35#		12"	@	45#	to si	Ze			

We can furnish I (one) Beam or carloads. Other sizes available in Wide Flange Beams, other Structurals, Plates, Bars, etc.

PHONE-WIRE-WRITE

### ASSOCIATED STEEL CORPORATION

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Cutting Off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS

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### GOSS

CHUCKING MACHINES

GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN

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Chestnut and 56th Streets

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Used - As Is - Reconditioned

### **RAILWAY CARS**

All Types

SERVICE-TESTED ®

# FREIGHT CAR REPAIR PARTS

For All Types of Cars

### LOCOMOTIVES

Diesel, Steam, Gasoline, Diesel-Electric

### SPECIAL OFFERING

25 — 70-Ton Capacity, All-Steel Covered Hopper Cars REPAIRED—IMMEDIATE DELIVERY!

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6,000- 8,000- and 10,000-Gallon Cleaned and Tested

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50-B Church Street New York 7, N. Y. Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

### News of Used and Rebuilt Machinery

Happy and Unhappy . . . Used machinery dealers in Detroit are happy about the volume of business, but unhappy about the profits they are making. Inquiries continue to come in at a good rate and machines are selling. But they are becoming more difficult to replace.

Why . . . Here is how the dealers explain the situation: Increased number of auctions in the area makes it impossible, they say, for them to replace floor stocks. Prices are pushed too high. Dealers insist they couldn't begin to sell a machine at an approximate price. The situation is all the more puzzling because auction sales are on an "as-is" basis, with no guarantee from the seller. Plants that sell equipment directly to dealers are beginning to demand the same high prices paid at auctions. Dealers believe that they are more in competition with auctioneers than they are with each other. Result has been profits cut to a minimum.

Business Good . . . Actually business in April was fairly good. Tool room equipment is still the best seller, good boring and milling machines are at a premium, as are lathes and other similar types of machines. There has been a noted pickup in the demand for screw machines. Several dealers report that sales have increased appreciably in the last two months. Buyers in most cases were automotive parts suppliers. Presses are also in short supply with number of calls for them increasing.

Far and Wide . . . Demand is strong from other parts of the country. Inquiries are coming in steadily from all parts of the Midwest and in a few cases from the West coast. Some dealers say that 50 pct of their business is conducted outside of Michigan. Big-

gest factor in these sales is freight. Sales depend on how badly a customer needs a machine. Machines moving out of the area must be badly needed because there have been few complaints about freight costs.

Parts Problem . . . Replacement parts are becoming a problem. It isn't as bad as it has been in other years but it is getting worse. Dealers are either making their own parts or farming the jobs out to small shops. Occasionally, a dealer will buy an old machine just for parts.

Down and Up . . . The general outlook is that business will be a little slower in July and August. Dealers feel that activity will have reached a crest before then and will begin to decline slightly. The primary cause is expected to be switchover to new models at the various auto companies. But this slowdown is expected to be only temporary. The demand for machines, especially production equipment, is expected to increase once production is rolling on the new cars.



"It's a receipt for withholding tax, social security, hospitalization, group insurance and a bill for \$1.37."

### CONSIDER GOOD USED EQUIPMENT

BENDING ROLLS

6' x %" Kiling Pyramid Type
6' x %" Niles Initial Type
12' x %" (Seveland Pyramid Type
12' x %" Niles Pyramid Type
12' x 1' Southwark Pyramid Type
BRAKES—LEAF TYPE
8' x %" Dreis & Krump No. 186
12' x %" Dreis & Krump
12' x %" Oreis & Kru BENDING ROLLS

CRANES-OVERHEAD ELECTRIC TRAVELING CTRIC TRAVELING
29' Span 230 Veit D.C.
48' Span 230 Veit D.C.
48' Span 220 Veit D.C.
59' Span 220 Veit D.C.
99' Span 220 Veit D.C.
99' Span 500/3/96 A.C.
99' Span 500/3/96 A.C.
99' Span 230 Veit D.C.
71' Span 230 Veit D.C.
80' Span 230 Veit D.C.
80' Span 250 Veit D.C.
87' Span 250 Veit D.C.
88' Span 250 Veit D.C.
89' Span 250 Veit D.C.
89' Span 250 Veit D.C. P&H Shepard Niles
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Confidential Certified Appraisals

FORGING MACHINE
1" to 5" Acme, Ajax, National FURNACE 300 KVA Allis Chalmers Induction Melting Furnace Mercury Arc Couverter

HAMMERS BOARD DROP-STEAM DROP STEAM FORGING-800 lb. to 20,000 lb.

HAMMERS-MISC. #3B Lobdell Nazel, Capacity 4" Square 2000 lb. Chambersburg Ceco-Drop 2000 ib. Chambersoni Converses

LEVELLERS—ROLLER

60" United 17 Rolls 3\%" Dia.

72" McKay 17 Rolls 4\%" Dia.

84" McKay Type E, 17 Rolls 5\%" Dia.

84" McKay 1996 By 17 Books 5 A MULTI SLIDE MACHINE
No. 35 U. S. Multi Slide Machine with Edgewise

PRESS—GAP FRAME
125 ton Beatty Inclined Open Back Gap Press, Stroke
1½" Bed Area 28% x 16%" (New)

1½" Bed Area 28½ x 18½" (New) PRESSES—HYDRAULIC 530 ton Baldwin Southwark 12" stroke 48" x 25" Between Columns 1500 ton 4-Col., 24" Stroke, 40" Bet. Columns 1257 ton Bailwin Southwark Forging Press, Stroke Main Ram, 54" x 1" Bet. Columns 4500 ton 3-L-H Hydr. Forging Press,

4000 ton B-L-H Hydr. Forging Fress
PRESSES—STRAIGHT SIDE
60D-84 Clereland Double Crank 14" Stroke Bed
Area 46" x 84"
Clearing Model TF41500-200 Triple Acting Strokes
40, 32, 14", Bed Area 100" x 200"
PUNCH & SHEAR COMBINATIONS
Style EF Cleveland 36" Throat, Punch 1½" thru 1"
Style W Cleveland 60" Throat, 312 Ton

ROLLING MILLS

10" 16" Single Stand, Two High

12" 16" Phila., Single Stand, Two High

12" 12" 18" Phila., Single Stand, Two High

12" 12" Standard Single Stand, Two High

15" 128" Farrel Single Stand, Two High

15" 12" Farrel Two Stand, Two High

16" 12" Farrel Two Stand, Two High

22" 12" 140" Lewis 3-High Sheet Mill

12" Three High Bar Mill

26" 1 Stand Two High

27" Two High Bar Mill

26" Torrington Ring Type Reversing Mill

For cold reducing 7" wide strip

ROLLS—FORMING

8 Stand Bafter Tube Forming Machine, Spindle 1%"

SHEAR—BAB SHEAR-BAH Pels Type IS-23, Capacity 2" Bd., 1%" Sq. SHEAR-BILLET
No. 7 Hilles & Jones, Motor Drive, Cap. 5" Sq. SHEARS—GATE 80" x %" Pels 86" x 1" Hilles & Jones SHEARS—SQUARING 12' x 3/16" Cincinnati #1412 12' x 3/6" Niagara, NEW 1951 12' x 3/4" Steelweld

12' x %" Steelweld
SLITTERS
36" Yoder Slitting Line
G-48 Yoder Gang Slitter, 5" Threaded Arbor
STRAIGHTENERS
Kane & Rouch 2 Roll Rotary Straightener, M.D.
Capacity Mildsteel %" to 3"
Actual Standard 12 Roll Straightener. Capacity 2\%"
5/16" Shuster Rotary Straightener & Cut-Off

Manufacturing

### A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8

Equipment

Liquidations-Rong Fide Auction Sales Arranged

RE-NU-BILT **ELECTRIC POWER** EQUIPMENT D. C. MOTORS

Qu.	H.P.	Make	Type	Voits	RPM
	2300	G.E.	MCF	600	400/500
1	1200	G.E.	MCF	600	650/890
1	1000	G.E.	MCF	600	350/700
1	940	Whas.	QM	250	140/170
1	800	Whee.		250	450/550
1	500	Whee.	OC-216	600	300/900
1	500	G.E.	MCF	230	250/750
3	450	Whee.		550	415
1	250	G.E.	MPC	230	400/600
1	200	G.E.	CD-1650Z	230	500/1500
1	200	Whee.	CB-5118	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
3	150	Cr. Wh.	83H-TEFC	230	890
1	150	Whas.	8K-151B	230	900/1800
1	150	Whee.	SK-201	230	360/950
1	120	G.E.	MCF	230	250/1000
1	125	Whee.	BK-188	230	850
8	100	Rel.	1050T	230	400/1200
2	100	Whee.	BK-181	230	450/1000
2	75	C.W.	58H-THFC	230	860
1	50	G. M.	MD-412AE	230	550

M-G Sets-3 Ph. 60 Cy.

Qu.	K.W.	Make	RP		
1	3000(31	U) G. E.	514	600	4000/6900/
					13200
2	2000/240		450	250/300	2300/4600
1	1750/2100		514	250/300	2300/4600
R	2000	G.E.	500	25cg 660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	728	600	8600/13200
1	1250	Whee		600	2300
1	750	Whee.	. 900	250	2300/4000
1	500	Whee	. 900	125/250	440
1	200	Whee	1200	250	440
		TRA	NSFOR	MERS	
Qu.	KVA	Make	Туре	Ph.	Voltages
3	1000 G	.33.	HVDDJ	1	2400x480
	1000 98	To one on	OTOO		Y 0 0000- 1 00

13200x460 13800x2300 13200x6609 7200x2400/4160Y 13200x2309 2300/4000x230/468 4160x480/277 34500x120/248 13200x120/248 4300/2400x230/468 Kulh G.E. G.E. G.E. Penn. Whee. G.E. G.E. OISC OISC HS HD HSWB HT DISC OISC HKS HT

BELYEA COMPANY, INC. 47 Howell Street, Jersey City 6, N. J.

4" National Upsetter High Duty, guided over-arm slide, air clutch

Ajax & National Upsetters, suspended slide, 2½", 3", 4"; similar upsetters not suspended slide, ½", 1", 1½", 2", 3"

" Acme Upsetting & Forging Machines sus-pended slide, cam side die slide

700-ton Ajax High Speed Forging Press

50,000# Standard Double Draw Bench #3 Abramson Bar & Tube Straightener

Pels FV-75 Bar & Biller Shear, Cap. 75%" rd 10' x 1/2" Plate Shear, Long & Allstatter 10" throat, M.D. Rebuilt

10' x 1" Long & Alistatter Plate Shear

Hilles & Jones and Buffalo Shears 11/2", 2",  $2^{11}/2$ ",  $3^{11}/2$ ",  $3^{11}/4$ ",  $4^{11}$ " and  $4^{11}/4$ "

1600 & 2750# Chambersburg Model F Board Drop Hammers, Roller bearing; double V-ways, Built 1943

I500# Niles & 2500# Chambersburg Single Leg Steam Forging Hammers 4000# Niles Bement Double Frame Steam Forge

Bradley Hammers, various sizes, including 500# Upright

Nazel Air Forging Hammers, #2-B, 4-B, 5-N Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U-type

Landis Landmaco and other Landis Threading Machines from 1/4 to 4" Single and Double End Punches

Multiple Punches

No. 3 Motch & Merryweather Saw, with Saw Grinder

BOLT, NUT AND RIVET MACHINERY, COLD MEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MERS, CO

DONAHUE STEEL PRODUCTS CO.

Consulting Engineering Service Surplus Mfg. Equipment Inventories Purchased

		MOTOR GET	TERMIN	2K 2K12	
Qu.	KW	Make	B.P.M.	D.C. Volta	A.C. Volts
1	2500	Whae.	720		4160/2300
1	2000	Al. Ch.	720	250	4160/2300
1	1200	Whse.	720	600	2300
1	1120	Elliott	720	260/280	2300
1	500	G.E.	1200	250	2300/440
1	500	Cr. Wh.	720	575/600	2300/440
1	300	G.E.	1200	250/275	2300
1	200	Elliott	1200	125	4000/2300
3	150	G.E.	1200	250	2300/440
	120	Whse.	1200	250	2300/440
1	100	Al. Ch.	1200	250	4000/2300
	1	LARGE MILL	TYPE	MOTORS	
Des	68 ED	Make	ED ED 88	Malle	Tuna

4	100	AL CH.	1200	230	4000/2300
	L	ARGE MILL	TYPE	MOTOR	15
Qu.	HP	Make	R.P.M.	Volta	Туре
1	3000	Whse.	600	525	Tandem
1	1500	Whse.	600	525	Rev.
1	700	Al. Ch.	135	230	Mill
2	600	Al. Ch.	300/600		Mili
2	600	Whae.	110/228		Mill
1	450	Whas.	450/600		SK
1	300	Whee.	300	230	M111
4	275	Whse.	425/850	230	QM-660.6
1	150	Whae.	360/720	600	QM-666.3
		CLID DIS	C 140		

SLIP RING MOTORS

Constant Duty 3 Phase 60 Cycle

HP R.P.M. Make Type
100 438 Al.Ch.
100 456 G.E. 1-15A-M 230
100 909 El. Dy. 28
100 100 W. 200 W. 200
100 100 W. 200 W. 200
100 100 W. 200 W. 200
100 W. 200 W. 2

T. B. MAC CABE COMPANY 4302 Clarissa St., Philadelphia 40, Penna.

Cable Address 'Macsteel' Philadelphia, Pa.

1913 W. 74th Street, Chicago 36, III.

#1 & #2 Buffalo Forge Vertical Bending Rolls. Leg-in Attachment. Late Type. #1/2 & #11/2 Buffalo Universal Ironworker. Coper, Notcher. Late Type.

### FALK MACHINERY COMPANY

Rochester 5, N. Y. Baker 5887 16 Ward St.

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desires to contact an American Concern with a view to building their equipment under License for sale in the European Market. Would prete to build a machine of approved design having an established American Market, but will consider a machine having no established market, provided it is of unique design, giving it good sales potential. Representative Director, Mr. Wm. Brett, will be in the U. S. during June. Any correspondence, etc., addressed to him c/o Bank of America, New York, will have attention.

Canterbury Engineering & Precision Works Ltd. Wincheap, Canterbury, Kent.

### EMPLOYMENT EXCHANGE

HELP WANTED

### ENGINEERING EXECUTIVE

Rapidly expanding steel company has opening for engineer whose administrative qualifications include the supervision of design, construction and layout of rolling millsblast furnaces and steel making

Here is an outstanding opportunity if your abilities and experience meet the needs of this position.

Send complete resume, including salary requirements, to:

ADDRESS BOX G-330

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### **PROCESS** DEVELOPMENT ENGINEERS

Several exceptional career apportunities have developed in a fast-growing division of a leading corporation. Development work includes sheet metal welding and brazing, casting, forging, and extruding. Openings at many experience levels. Send typewritten resume including present earnings to

ADDRESS BOX G-324
Care The Iron Age, Chestnut & 56th Sts., Phila. 39

### WORKS MANAGER

We are seeking a man to direct all manufacturing for our company. which is located in a good small Eastern city. Our reputation for quality is excellent, our operations have been profitable over many years and annual sales volume is now about \$10,000,000.

> Iron or Steel Foundry experience essential

We would like a man who has directed the manufacturing of medium and heavy industrial metal products. A man with the right potential can look forward to becoming general manager in the near future. Age should be between 40 and 55 years. Salary will be in the \$20,000 to \$25,000 range. State briefly pertinent experience, age and home telephone. All replies confidential.

ADDRESS BOX G.325

Care The Iron Age, Chestnut & Soth Sts., Phila. 39

### WANTED - EXECUTIVES

5 PLANT MGRS. \$12-25,000
Sheet, Bar, Red, Wire, Tube Mills.
4 SUPTS. Rolling Mills \$10-15,000
IND. REL. REP. \$7,500
IND. REL. REP. \$7,500
Also Training Directors & Safety
Engineers. Rolling Mills.
3 CHIEF IND. ENGRS. \$8-12,000
Also Ind. Engrs. Metallurgists. Non-ferrous Mills.
PLANT ENGR. \$12-15,000
Rolling Mill Experience.
QUALITY CONTROL DIR. \$11,500
Weldments, Heavy Machining.

Employers pay all expenses, our fee. Submit resumes in confidence to:

J. L. OVERHOLT WAbash 2-5020 202 S. State Chicago Wabash Agency

ASSISTANT PLANT MANAGER to assist in managing of cast iron plumbing fixture plant. Give full particulars. Good opportunity and salary. Address Box G-332, care The Iron Age, Chestnut & 56th Sts., Philadelphia 39.

### METALS MARKET ANALYST

Excellent opportunity offer preferably for metallurgical or mechanical engineer who has done market research work on potential for metals or metal products; to take charge of market research work on non-ferrous metals in large firm located in New York City. Work will be on lead, zinc, bronze, nickel, titanium metal and new products.

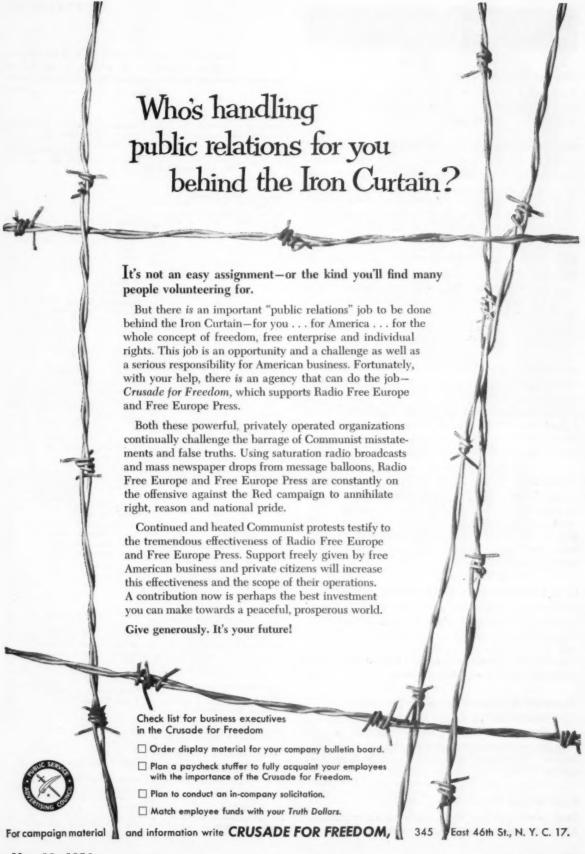
ADDRESS BOX G-326

Care The Iron Age, Chestnut & 56th Sts., Phila. 39 State previous experience and salary requirements.

METALLURGICAL ENGINEER, young, graduated with 2 to 5 years' steel mill experience for supervisory position in Quality Control dependent of Integrated Steel plant. Salary open. Location Southeastern Penna. Address Box G-338, care The Iron Age, Chestnut & 56th Sts., Philadelicia.

METALLURGISTS: Company engaged in METALLURGISTS: Company engaged in basic process and pyrometallurgy requires several men for Production, Development and Quality Control who have some experience in one or more of the following: Smelting and Refining, Steelmaking, or Electric Furnace Operation. Excellent opportunities for qualified men. Hospitalization, maxing, or Electric Furnace Operation. Excense opportunities for qualified men. Hospitalization, insurance and pension plan provided by Company Plants located midwest, north and south. All replies held strictly confidential. Submit detailed resume. Address Box G-323, care The Iron Age, Chestnut & 56th Sts., Philadelphia 39.

WANTED: FORGING CHIEF ENGINEER. WANTED: FORGING CHIEF ENGINEER.
Opening at once in mid-west forging company for this man: Age 45-55. Must know die sinking and die design and come from independent rather than captive shop. Will have supervision of die room foreman and engineering staff. Will report direct to president. Company employing 110 men. Equipment Chambersburg board hammers up through 3000 lbs. Please state experience and present compensation. Your letter will be treated with absolute confidence. Address Box G-336, care The Iron Age, Chestnut & 56th Sts., Philadelphia 39,



### METALWORKING BRIEFS

### Wildcat Steel Strike Ends

A one-week wildcat strike at West Virginia Steel & Mfg. Co. ended Monday. Walkout cost about 1500 tons of electric furnace steel.

### Urge More Money For Delaware River Project

Congress is getting complaints that the \$100,000 asked by the Administration to begin a survey looking toward deepening of the Delaware River from Trenton to Philadelphia is inadequate. Proponents say \$500,000 toward the survey would be more like it. Project eventually will cost \$91 million.

### U. S. Steel Tries Vacuum Casting

Vacuum casting of large forging ingots will begin soon on an experimental basis at U. S. Steel's Duquesne Works. Process is expected to improve quality of large ingots by reducing amount of trapped gases. New equipment resulted from experiments by U. S. Steel's research department.

### New High Temperature Alloys Developed

International Nickel Co. announces two new high temperature alloys for aircraft and industrial gas turbine applications. Inconel "700" is designed for forged aircraft gas turbine blades at temperatures up to 1650°F, while Incoloy "901" is suitable for operating temperatures of 1000 to 1400°F.

### **British Steel Prices Climb**

Prices of most British iron and steel products went up an average of 5 pct effective May 7. Increases were attributed to higher production costs and increased prices of imports and scrap. Efficiency of new strip mills kept some flat-rolled prices at present level, lowered others.

### U. S. Steel's Growth: 1 Million Tons a Year

Future expansion of the steel industry is indicated by Roger M. Blough, chairman of board of U.S. Steel. He says that his company, at a conservative estimate, will have to expand its capacity one million tons a year for next decade to keep pace with nation's steel needs for defense and expansion.

### Competitive Atomic Power In 10 Years

Chairman Strauss of Atomic Energy Commission predicts that nuclear-electric power will compete costwise with conventional power within 10 years. Admiral Strauss also reveals that over 7 private firms have applied to AEC for reactor licenses.

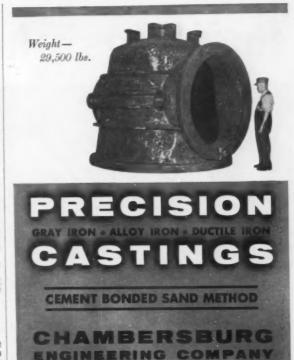
### Steel Output Slips

Steel production last week slipped to approximately 2,375,000 tons from 2,473,000 the previous week.

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A	
Abbas, J. T. Machinery 169  Aetna-Standard Engineering Co., The 87  Air Reduction 116  Allis-Chalmers Mfg. Co., Between Pages 48 & 49  American Air Compressor Corp. 166  American Screw Co. 48  *American Steel Foundries Elmes	Donahue Steel Products Co., Inc. 165 Dony, D. E. Machinery Co 166 Dow Chemical Co. Between Pages 16 & 17 *Dreis & Krump Mfg. Co 13
Engineering Div	Eastern Machine Screw Corp., The 163 Eastern Machinery Co., The 167 *Electric Controller & Mfg. Co., The 90 Electric Equipment Co 167 *Electro-Alloys Division American Brake Shoe Company 28 *Enthone, Inc
*Baker & Company, Inc	Erie Bolt & Nut Co
Inside Front Cover	
Belyea Co., Inc	F
Bennett Machinery Co.   165	Fabrikant Steel Products, Inc
Inc	
Buffalo-Eclipse Corporation 122 *Bunting Brass & Bronze Co 126	Galbreath Machinery Co
c	Globe Trading Co 169
Conterbury Engineering & Precision Wks, Ltd. 170 Canton Drop Forging & Mfg. Co., The 163 *Carpenter Steel Co., The Alloy Tube Div. 47 Chambersburg Engineering Co. 173 Chicago Electric Co. 167	Goodman Electric Machinery Co. 167 Goss & DeLeeuw Machine Co 163 Great Lakes Steel Corp 49 Griffin Manufecturing Co 161
*Cincinnati Bickford Division Gid-	H
dings & Lewis Machine Tool Co. 12 Cincinnati Milling Machine Co., The Cincinnati Milling Products Division 45 *Cleveland Cap Screw Co., The 37 Colorado Fuel & Iron Corp., 14 & 15 Colorado Fuel & Iron Corp., 17 Wickwire Spencer Steel Div 173 Consolidated Machine Tool Corp. 17, 18, 19, 20	Hanna Furnace Corp., The
Consolidated Railway Equipment Co.  Continental Foundry & Machine Division Blaw-Knox Co	Hyman, Joseph & Sons 166 Hyman-Michaels Co 166
Curtiss-Wright Corporation Metals Processing Division IS3	I Ingersoll-Rand Impactool Division
	Ingersoll Steel Division Borg-
*Deming Co., The	Iron & Steel Products, Inc 164 Ivins, Ellwood Steel Tube Wks.

J I	R
Johnson, S. J. Co	*Raybestos-Manhattan, Inc. Manhattan Rubber Div
*Kearney & Trecker Corp 78 *Keystone Steel & Wire Co 110	
	s
	*Seneca Falls Machine Co., The
*Lake Erie Engineering Corp. 16 Land, L. J., Inc. 168 Lang Machinery Co. 169 *LeBlond, R. K. Machine Tool Co., The 32 & 33 *Leschen Wire Rope Div., H. K. Porter Company, Inc. 86 Luria Bros. & Co., Inc. 149	Somers Brass Co., Inc. 9
M	
McGregor-Michigan Corp 85	т т
MacCabe, T. B. Co. 165 Manhattan Rubber Div. Raybestos- Manhattan, Inc. 26 Manning, Maxwell & Moore, Inc. 131 "Marchant, Geo. F. Co. 121 "Marshall Railway Equip. Corp. 169 Martin, Joe Co., Inc. 169 Master Electric Co., The Inside Back Cover	Texas Company, The
Master Products Co	U
*Metal Carbides Corp	Ulbrich Stainless Steels
*Mundt, Chas. & Sons 161	٧
	Vanadium Corp. of America 10
N	
National Broach & Machine Co. 41 National Machinery Exchange 166 National Roll & Foundry Co	Wallack Bros.         169           Waterbury-Farrel Foundry & Machine Co.         38           Weiss, B. M. Co.         166           Weiss Steel Co., Inc.         169           Wheland Co., The         108
	Wood, R. D. Co 74
*Ohio Electric Mfg. Co., The 15 Ohio Steel Foundry Co., The & Ornitz Equipment Corp 16 Osborn Mfg. Co., The	7
Overholt, J. L., Mgr 17	0
	Youngstown Sheet & Tube Co., The 27





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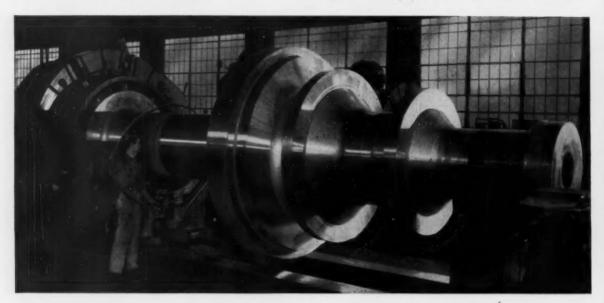
\*\*Pithsburgh Lectromett Furnace Corp. 125
Corp. 125
Pithsburgh Steel Co. 22 & 23
Pope Machinery Corp. 132
Portage Machine Co., The 135
Purdy Company, The 167

\*\*Business Opportunities 170
Clearing House 164-169
Clearing House 164

### INDUSTRIAL WIRE CLOTH THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION-Atlanta . Boston . Buffalo . Chicago Detroit . New Orleans . New York . Philadelphia . THE COLORADO FUEL AND IRON CORPORATION—Albuquerque « Amarillo » Billings » Boise Butte « Casper » Denver » El Paso » Ft. Worth » Houston » Lincoln (Neb.) Los Angeles » Oakland » Oklahoma City » Phoenix » Portland » Pueblo Salt Lake City . San Francisco . Seattle . Spokane . Wichita

# Their job is to help make power



Here are two giants of steel that were recently created in the Bethlehem shops. Though dissimilar in shape and dimensions, their basic business is the same—to help make power for the country's growing needs.

That big shaft will do an important job in a Western hydroelectric project. A forging made of carbon-vanadium steel, it weighs approximately 61 tons. Its overall length exceeds 22 ft.

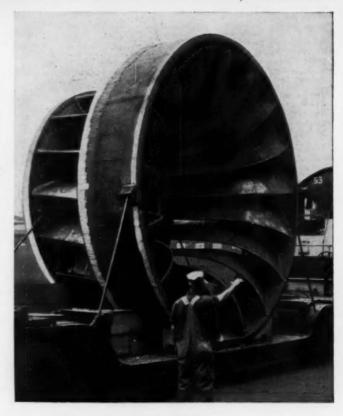
The vaned runner in the other illustration is a foundry product. Like the forging, it's a whopper, weighing 49 tons. It too is earmarked for a hydroelectric installation.

Through the years Bethlehem has furnished many large components for use in power production. Countless Bethlehem forgings and castings are also in service in other industries. Some of these pieces are huge—but please remember, we're equally well equipped to turn out small items, too. For instance, some of the drop forgings we make are small enough to tuck into your vest pocket.

When your needs call for either forgings or castings, we hope you'll get in touch with us. Whether your order runs to tonnage or is small, we'll give it all we've got!

### BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

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# ALTERNATING CURRENT MOTOR SERIAL STYLE TYPE FRAME H.P. CYCLES AMPS. PHASE R.P.M. PHASE SERVICE FACTOR CODE RATING MANUFACTURED BY OTHE MASTER ELECTRIC CO., DAYTON, O., U.S.A. PATENTS PENDING

What are your power drive requirements? Here at Master, with the widest selection in the nation to choose from, you're sure to fill your needs quickest and best.

Need something special in gear reduction—electric brakes—variable speed operation—fluid drive or special mounting? Or would some of our standard models (1/8 to 400 H.P.) fill the bill? You'll find the answer here! And remember, all Master components are engineered to form combinations of units in one streamlined, compact package of efficiency. Name your need and the name that fills it is Master—for greater salability of motor driven products; for increased productivity of plant equipment.

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helps solve
research problems
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forming . . .
at minimum cost!

Elmes 1500-Ton Development Press at ford Motor Company, This press can perform work at full tonnage at rate of 600 ipm., using only 250 hp. Die space, 60" x 60". Opening, 132". Stroke, 42".

At Ford Motor Company, emphasis is being placed on the research and development of new cold metal forming techniques. Important in this work is the custom-built Elmes Press shown above . . . a 1500-ton hydraulic press designed specifically for this program.

Having all the inherent advantages of hydraulic press operation, this press can also simulate the stroke action of a mechanical press. This unique operational versatility enables Ford to determine in advance the proper size and type of production press—hydraulic or mechanical—which will be most efficient for a particular job. As a result, Ford is able to go immediately into production without a lengthy and costly tryout period on regular production line presses.

Like other leading manufacturers, you too will profit when you bring your pressing problems to Elmes. New Bulletin No. 1010-C gives complete data on Elmes Metalworking Presses. Recommendations and cost estimates are yours for the asking. Contact the Elmes distributor in your area or write to us direct.

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